E XI NUMBER 1

The New Hampshire College Catalog

1920–1921
FIFTY-SECOND YEAR

REGISTER, - - 1919-1920
ANNOUNCEMENT, 1920-1921

Durham, New Hampshire
APRIL, 1920

The New Hampshire College of Agriculture and the Mechanic Arts Bulletin

Durham, New Hampshire

Save this catalog and bring it to college. You will need it for reference throughout the year

APRIL, 1920

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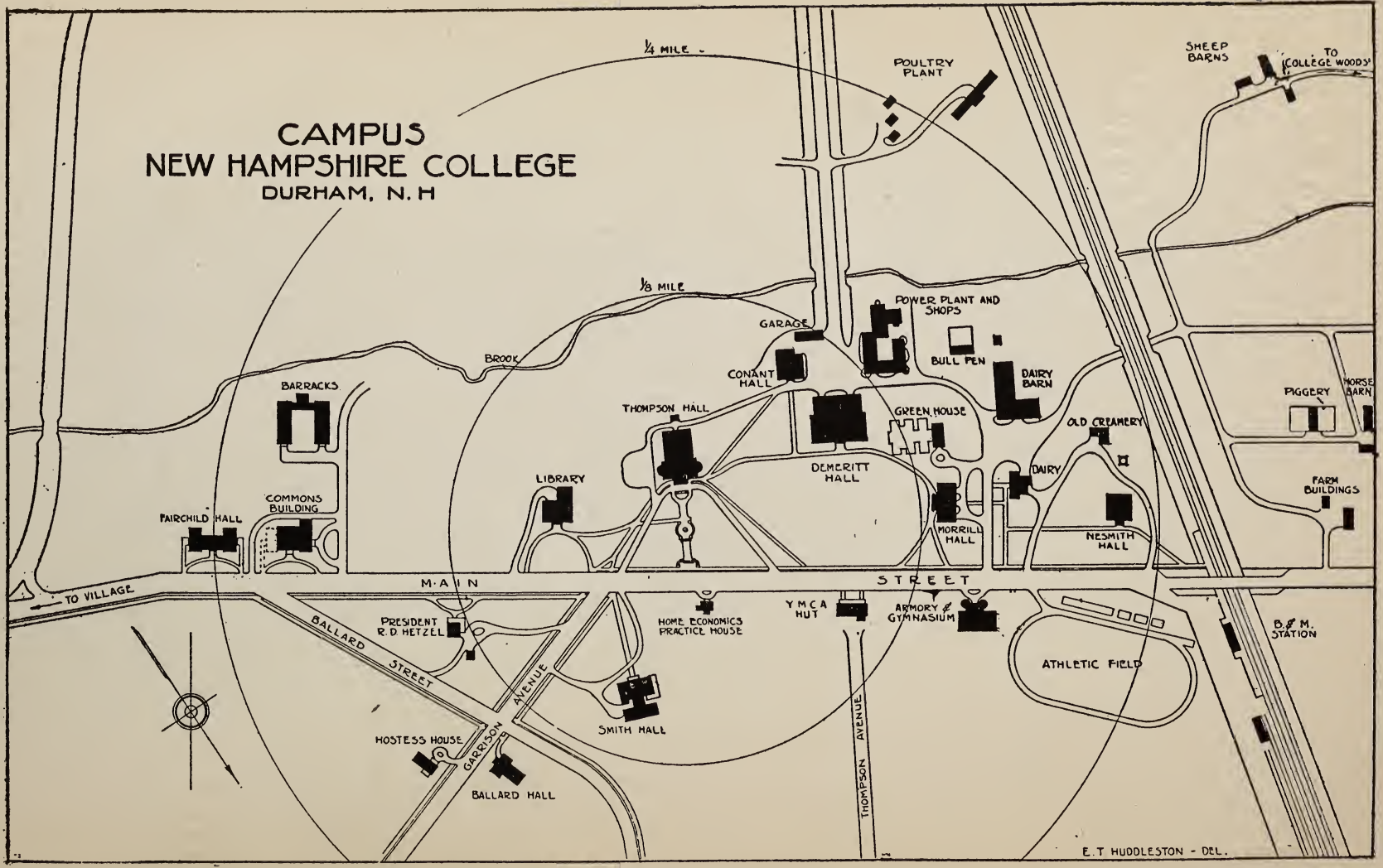

This map shows the buildings of the college and the immediately adjacent grounds. It does not include the college farms, forests, gardens or orchards.

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Departments are arranged alphabetically under their respective administrative divisions.

The number and title of each subject is given in black face type. The number of each subject is divided into two parts: first, the numeral designating the particular subject; and second, the letter (a, b, or c) designating the term in which the subject is given. The letter "a" indicates that a subject is given the first term; "b," the second term; and "c," the third term. A combination of the letters (a-b, b-c or a-b-c) attached to a numeral indicates that the subject is given through the term represented by each of the letters.

Following the number of each subject is the description of the work given, and the name of the instructor.

The next paragraph gives the following information in the order indicated: (1) prerequisites, if any; (2) in what courses the subject is required and the undergraduate year in which it should be taken; (3) the number of credits the subject will count toward graduation; (4) the number of lectures, recitations, or laboratory periods required a week. (Lectures and recitations are fifty minutes in length. Laboratory periods are two and one-half hours in length and an additional half-hour of work may be required for one credit hour.)

All subjects unless otherwise noted are open to students who have passed the prerequisites.

An elective subject will be given only when there is a minimum of five students registered for the same.

CALENDAR

1920

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COLLEGE CALENDAR 1920–1921

1920

FALL TERM

*Sept.	21	Tuesday	Registration Day
Sept.	21	Tuesday	†First lecture on "College Opportunities and Responsibilities" at 7.15 P. M.
Sept.	22	Wednesday	Recitations begin at 8.00 A. M.
Oct.	4	Monday	†Second lecture on "College Opportunities and Responsibilities"
Oct.	13	Wednesday	Annual Meeting of Board of Trustees
Oct.	18	Monday	†Third lecture on "College Opportunities and Responsibilities"
Nov.	1	Monday	†Fourth lecture on "College Opportunities and Responsibilities"
Nov.	8	Monday	Mid-Term Warnings to be filed
Nov.	15	Monday	†Fifth lecture on "College Opportunities and Responsibilities"
Nov.	24	Wednesday	Thanksgiving recess begins at noon
Nov.	29	Monday	Thanksgiving recess ends at 8.00 A. M.
Dec.	6	Monday	†Sixth lecture on "College Opportunities and Responsibilities"
Dec.	17	Friday	Fall Term closes at 4.00 P. M.

1921

WINTER TERM

Jan.	3	Monday	Registration Day
Jan.	4	Tuesday	Recitations begin at 8.00 A. M.
Jan.	12	Wednesday	Meeting of Board of Trustees
Feb.	14	Monday	Mid-Term Warnings to be filed
Feb.	22	Tuesday	Washington's Birthday (Holiday)
Mar.	8	Tuesday	Spring Elections—Classes dismissed at 10.00
Mar.	23	Wednesday	Winter Term closes at 4.00 P. M.

SPRING TERM

Mar.	29	Tuesday	Registration Day
Mar.	30	Wednesday	Recitations begin at 8.00 A. M.
Apr.	13	Wednesday	Meeting of Board of Trustees
May	4	Wednesday	New Hampshire Day (Subject to change)
May	9	Monday	Mid-Term Warnings to be filed
May		Thursday	Junior House Parties begin at 4.00 P. M.
May		Sunday	Junior House Parties end at 2.00 P. M.
May	30	Monday	Memorial Day (Holiday)
June	17	Friday	All Examinations close at 4.00 P. M.
June	18	Saturday	Alumni Day
June	19	Sunday	Baccalaureate Day
June	20	Monday	Class Day
June	20	Monday	Meeting of Board of Trustees
June	21	Tuesday	Commencement Day

* New students are urged to present themselves for registration on Monday, September 20.

† All Freshmen (men and women) are required to attend these lectures. Others are invited. Men's Gymnasium, 4.30 P. M., except on September 21.

BOARD OF TRUSTEES

His Excellency, Governor John H. Bartlett, A.B., *ex-officio*
President, Ralph D. Hetzel, A.B., LL.B., LL.D., *ex-officio*

*Hon. Harvey L. Boutwell, B.S., LL.D., *President*	Malden, Mass.
Sept. 1, 1911, to Sept. 1, 1920	
Hon. James A. Tufts, A.B., *Secretary*	Exeter
Jan. 10, 1914, to June 14, 1922	
*Hon. Edward H. Wason, B.S., D.SC.	Nashua
Jan. 16, 1906, to Aug. 1, 1922	
Hon. Richard W. Sulloway, A.B.	Franklin
May 13, 1909, to Oct. 31, 1921	
Hon. William H. Caldwell, B.S.	Peterborough
July 29, 1912, to July 29, 1921	
Hon. Eugene S. Daniell	Greenland
June 14, 1916, to June 14, 1922	
Hon. Roy D. Hunter	West Claremont
June 14, 1916, to June 14, 1922	
Hon. Dwight Hall, A.B.	Dover
Oct. 29, 1915, to July 17, 1921	
Hon. Andrew L. Felker	Meredith
July 17, 1917, to July 17, 1920	
Hon. William T. Nichols, A.B.	Manchester
Feb. 15, 1918, to Feb. 15, 1921	
Hon. John C. Hutchins	North Stratford
Oct. 3, 1918, to Aug. 30, 1920	

* Elected by the Alumni.

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OSCAR W. STRAW, *Superintendent of Power and Service*

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MRS. MABELLE S. HATCH, *Assistant Manager of the Commons*
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MARY E. LAWLESS, *Stenographer*
MILDRED MADDOX, *Secretary to Engineering Division*

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CHARLOTTE A. THOMPSON, *Assistant Librarian*
HELEN G. CUSHING, B.A., *Catalog Librarian*
CAROLINE A. BARSTOW, *Library Assistant*

*The faculty is composed of the president of the college, full professors, associate professors, assistant professors, officers of the administration and the librarian.

† On leave of absence.

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CHESTER R. SNOW, CAPTAIN, *Professor of Military Art*
HARRY W. SMITH, A.M., *Professor of Economics*

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WILLIAM H. WOLFF, M.S., *Associate Professor of Pomology*
LEON W. HITCHCOCK, B.S., *Associate Professor of Electrical Engineering*

* On leave of absence.

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FRED C. WERKENTHIN, A.M., *Associate Professor of Botany*
ISA A. GREENE, B.S., *Associate Professor of Home Economics Education and Supervisor of Smith-Hughes Teacher Training Work in Home Economics*

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CLARENCE R. CLEVELAND, A.B., *Assistant Professor of Economic Entomology*
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RANDALL KERNAN, CAPTAIN, *Assistant Professor of Military Art*
WALTER S. FROST. B.S., *Assistant Professor of Chemistry*

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LYMAN J. BATCHELDER, *Instructor in Wood Shop and Foundry Practice*
HEBER F. DEPEW, B.S., *Instructor in Dairy Husbandry*
ALMA D. JACKSON, M.A., *Instructor in Zoölogy*
RUTH RICHARDSON, A.B., *Instructor in English*
BERNICE M. SMITH, *Instructor in Home Economics*
PAUL H. SHRAMM, *Instructor in Drawing*
ALBERT W. GAMASH, B.S., *Instructor in Forestry*
WILLIAM W. FINLEY, *Instructor in Machine Work and Forging*
ALLEN D. WASSALL, B.S., *Instructor in Electrical Engineering*

MARION L. CATON, *Instructor in Clothing*
WOODBURY F. HOWE, *Instructor in Physical Education*
HAINES B. QUIMBY, B.S., *Instructor in Mathematics*
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MAURICE E. GELINAS, B.S., *Instructor in Mathematics*
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HENRY G. BLOUNT, A.B., *Instructor in Economics*

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B. E. HUGGINS, *Assistant in Dairy Husbandry*
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C. J. O'LEARY, JR., *Student Assistant in Economics*
O. W. PIKE, *Student Assistant in Physics*
JAMES HAYES, SERGEANT, *Assistant in Military Art*
PATRICK HODGE, SERGEANT, *Assistant in Military Art*
JOHN MANNING, CORPORAL, *Assistant in Military Art*

NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION

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Hon. W. H. Caldwell, b.s.	Peterborough
Hon. E. S. Daniell	Greenland

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W. C. O'Kane, a.m., *Entomologist*
J. H. Gourley, m.s., *Vice-Director, Horticulturist*
O. R. Butler, ph.d., *Botanist*
E. G. Ritzman, b.s., *Animal Husbandman*
K. W. Woodward, a.b., m.f., *Forester*
J. M. Fuller, b.s., *Dairy Husbandman*
H. R. Kraybill, m.s., ph.d., *Chemist*
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C. R. Cleveland, b.s., *Assistant Entomologist*
J. R. Hepler, b.s., *Assistant in Vegetable Gardening*
F. C. Werkenthin, m.a., *Assistant Botanist*
M. G. Eastman, m.s., *Assistant Agronomist*
James MacFarlane, *Florist*
A. D. Littlehale, *Shepherd*

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H. B. Stevens, a.b., *Editorial and Recording Secretary*
O. V. Henderson, *Purchasing Agent*
Beatrice M. Richmond, *Bookkeeper*
Elizabeth E. Mehaffey, *Assistant Librarian and Mailing Clerk*
Beatrice E. Carlisle, *Secretary to the Director*
Betty I. Glidden, *Stenographer*
Christina M. Collins, *Stenographer*
Mildred Bartlett, *Stenographer*
Helen M. Hilton, *Stenographer*

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RALPH D. HETZEL, A.B., LL.B., LL.D., *President*
J. C. KENDALL, B.S., *Director of Extension Work*
E. P. ROBINSON, B.S., *County Agent Leader*
BERTHA E. TITSWORTH, B.S., *State Home Demonstration Leader*
H. A. MOSTROM, B.S., *State Leader Boys' and Girls' Club Work*
L. F. BROWN, B.S., *Agent in Dairying*
A. B. GENUNG, B.S., *Farm Management Demonstrator*
MARY L. SANBORN, *Asst. State Leader Boys' and Girls' Club Work*
DAISY D. WILLIAMSON, *Asst. State Home Demonstration Leader*

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W. C. STOKOE, B.S., *Coös County*
R. W. SMITH, D.V.M., *Belknap County*
W. R. WILSON, B.S., *Grafton County*
R. S. WETHERBEE, B.S., *Strafford County*
R. J. BUGBEE, B.S., *Carroll County*
R. W. PEASLEE, B.S., *Merrimack County*
D. D. WARD, B.S., *Rockingham County*
L. B. ROBINSON, B.S., *Hillsborough County*

COUNTY HOME DEMONSTRATION AGENTS

ANN F. BEGGS, *Hillsborough County*
PEARL A. GRANT, B.S., *Merrimack County*
HELEN F. MCLAUGHLIN, B.A., B.S., *Rockingham County*
KATHRYN E. WOODS, *Sullivan County*
ALICE J. BALLARD, *Belknap County*

ASSISTANTS TO THE STAFF

H. B. STEVENS, A.B., *Editorial and Recording Secretary*
BEATRICE E. CARLISLE, *Secretary to the Director*
ELIZABETH E. MEHAFFEY, *Mailing Clerk*
MARTHA E. FISHER, *Secretary to the County Agent Leader*
ESTHER L. HOBBY, *Secretary to the Agent in Dairying*
LILLIAN CURTIS, *Secretary to Boys' and Girls' Club Leaders*
NINA HAZEN, *Secretary to Home Demonstration Leader*

HISTORICAL SKETCH

The New Hampshire College of Agriculture and the Mechanic Arts was created by an act of the New Hampshire legislature in 1866 and was established at Hanover as a state institution, in connection with Dartmouth College. In its foundation the state legislature had accepted the conditions of an act of the federal congress of July 2, 1862, entitled "An act donating public lands to the several states and territories which may provide colleges for the benefit of agriculture and the mechanic arts." The state had accepted the land grant three years earlier, July 9, 1863.

In 1893 the college was moved from Hanover to Durham. This action followed the death of Benjamin Thompson, a farmer of Durham, who died January 30, 1890, and left to the college his entire estate, excepting a few minor reservations. The legislature accepted this bequest March 5, 1891, and appropriated the necessary money for the first buildings.

Shortly before the state accepted this bequest of Mr. Thompson the legislature further provided for the college by accepting the provisions of an act of congress known as the Morrill Bill. This legislation made available federal appropriations "for instruction in agriculture, the mechanic arts, the English language, and the various branches of mathematical, physical, natural and economic science, with special reference to their applications in the industries of life, and to the facilities for such instruction."

Although the college was able to make use of the Thompson land as early as 1893, it was not until 1910 that the income from this endowment of almost $800,000 became available. At present the college has an annual income from the Thompson funds of nearly $32,000. It also receives the moneys which are available as the result of the acts of congress referred to, and the biennial appropriations of the state legislature.

The college administration is in charge of a board of thirteen trustees. The governor of the state and the president of the college are *ex-officio* members. The college alumni elect two trustees, and the others are appointed by the governor with the advice and consent of the council.

NEW HAMPSHIRE COLLEGE

EXPERIMENT STATION

A branch of the college, known as the New Hampshire Agricultural Experiment Station, was established by the state, August 4, 1887, under an act of congress of March of that year. Its purpose is to acquire agricultural knowledge and to bring its information to the people of the state. The station is actively engaged in this work not only in Durham but throughout the commonwealth. Members of the agricultural faculty of the college serve on the station staff.

EXTENSION SERVICE

In addition to its functions of teaching resident students and conducting research investigations, the college has been developing rapidly during the past few years its function of carrying information and assistance in agriculture and home economics into all parts of the state. The first financial aid for non-resident teaching, or extension work, came in 1911 when the New Hampshire legislature appropriated a sum of money for this purpose. In May of the same year the board of trustees recognized the extension activities of the college as of prime importance and appointed a director of extension work.

The passage of the Smith-Lever act by congress on May 8, 1914, gave a decided impetus to this type of teaching. Under the provisions of this act, New Hampshire, like every other state, receives the sum of $10,000 annually from the federal government for supplementing and strengthening the extension work of the Agricultural College. In addition to this sum New Hampshire shares in increased allotments for seven years in the proportion which its rural population bears to the total rural population of all the states, provided the state shall appropriate an equal sum. During the year 1919–1920 the federal appropriation under this act amounts to $19,245, and the off-set provided by the state amounts to $9,245.

Under a triangular coöperative arrangement between the United States Department of Agriculture, the state college and the counties of the state, a field force of extension agents has been placed in the various counties to carry on an educational campaign in agriculture and home economics. Towards the development of this work, the county delegations at the legislative session of 1919 appropriated an annual sum of $34,310 for the next biennium. A supplementary act of congress, passed in July, 1919, also provided under the same terms as the Smith-

Lever act, funds which in New Hampshire amounted to $5,333 for the year 1919–1920.

As a result of these appropriations the extension staff of the college has been increased until there are now twenty-three members giving full time to the service. The members of the college and station staffs also contribute a large amount of time and render valuable assistance in carrying out the extension program.

SMITH-HUGHES WORK

The enactment by the federal government of the Smith-Hughes law in 1917 made available to the state of New Hampshire $15,000; federal moneys to be matched by an equal amount of state or local moneys. One third of this is to be used in the training of teachers of agriculture, home economics, and industrial education. Two thirds of the amount is to be used in partial payment of the salaries of teachers of these subjects in those public secondary schools which meet the requirements as set up by the Federal Board for Vocational Education in regard to teachers, equipment, etc. The New Hampshire State Board of Education has designated the state college as the institution which shall do the teacher training work provided for in this act.

SITUATION

Durham, the home of the college, is an attractive village on the Portland division of the Boston and Maine railroad, sixty-two miles from Boston, fifty-four from Portland, Me., and five from Dover, N. H., a city of 13,000 population. Good train service makes the college easily accessible from all parts of the state.

Durham is one of the historic towns of New Hampshire. In the early days it was the home of a prosperous ship-building industry. Situated at the head of tidewater on the Oyster River, it served as a distributing center for the interior of the state. During the Revolutionary War it was famous as the home of General John Sullivan. Near his home, in the village, the state has erected a fitting monument to his memory.

BUILDINGS AND EQUIPMENT

BUILDINGS

Thompson Hall is the main administration building and from its eminence commands a view of the entire campus. It contains, besides recitation rooms, the offices of the president, dean, registrar, business secretary, bookstore, and headquarters of the departments of modern languages, English, education and psychology, zoölogy, economic entomology, and home economics. The gymnasium for women is also in this building.

Morrill Hall is the headquarters of the agricultural division of the college and also has the office of the director of the experiment station and the experiment station library. In this building are the laboratories and lecture rooms of the departments of agronomy, animal husbandry, horticulture, poultry husbandry, and forestry. The building also contains a collection of farm implements and a cattle-judging room. The third floor provides quarters for agricultural extension workers, a reading room for agricultural students, and The Agricultural Club Room.

DeMeritt Hall.—The engineering building is the most prominent of the engineering group, and houses the departments of mechanical engineering, electrical engineering, physics, drawing and mathematics. It contains lecture, recitation, drawing, and office rooms for the several departments; also electrical, mechanical and physical laboratories, each one adapted to and equipped for its specific work.

Conant Hall is devoted exclusively to the department of chemistry. The second floor, containing lecture rooms and three laboratories, remains substantially as it has been for a number of years. The first floor has been recently fitted up with modern chemistry desks and other equipment to supply much needed additional laboratory facilities for students in chemistry. The building is thus well equipped for carrying on the chemical courses of the college, including those connected with chemical engineering, agriculture, and home economics.

The Library.—In accordance with an act of consolidation between the libraries of Durham and the college, the books of the Durham public library and the college are all shelved in one building, forming the Hamilton Smith Public Library. This consolidation makes an especially good collection, the scientific books of the college supplementing well the more popular books of the town library. The consolidated libraries number about 40,000 volumes and the reading room is supplied with 160 periodicals. The departments of sociology, of history and political science, and of economics are located in the library building.

Aside from the main library, each department has its working library of the more technical books and journals.

The library as a whole receives 300 periodicals; 160 of them, non-technical in character, are kept in the periodical and children's rooms; the rest, in the various departmental libraries. Numerous daily and weekly papers are received by the library.

The Dairy Building is well arranged and equipped for purposes of dairy instruction. It contains a commercial creamery, with sanitary milk room, separator room, churning room, and cold storage room; laboratories for instruction in milk testing, milk inspection, farm butter and cheese-making, and bacteriology; also a reading and exhibition room; a class room and offices.

The Shop Buildings consist of a woodworking shop, a machine shop, a forge room, a foundry, the boiler house, and a general repair shop connected with the power and service department.

Two additions were made to the shops by the carpentry and concrete sections of the New Hampshire College U. S. Army Training Detachment during the fall of 1918. The first addition is a two-story building 32 feet by 60 feet, the first story being devoted to machine work and the second story devoted to woodwork. The second addition is a two-story and basement building, 32 feet by 89 feet.

Locker rooms with lockers are provided for use of students taking subjects in shop work.

Nesmith Hall is occupied by the departments of chemistry and botany of the experiment station, and contains the laboratories of the department of botany of the college.

The Armory and Gymnasium contains the offices of the commandant and physical director, the rooms of the College Club and a large drill hall and gymnasium.

President's House.—The present structure is a substantial, attractive residence, erected in 1904 at an expense of $9,000. It replaced the original wooden structure which was burned in 1903.

Commons Building.—The legislature of 1917 provided $100,000 for erecting the Commons. An additional $5,000 was given by the 1919 legislature and the building made ready for occupancy in October, 1919. The Commons is a handsome brick structure of Georgian style and is modern in every respect. The main dining room in which both men and women of the college are served has a seating capacity of 300. The cafeteria seats 200 at one time. There are also two private dining rooms and two reception rooms. The dormitory on the third floor houses twenty-eight students.

Fairchild Hall.—This building, erected in 1916 at a cost to the state of $60,000, was named in honor of the late president of the college. It is a handsome brick structure of colonial design, which furnishes accommodations for 106 men.

Barracks A and B are frame buildings erected by the college in 1918 for the housing of soldiers in the Student Army Training Corps. The buildings have been partitioned off into moderate sized rooms and furnished in the same way as are the other dormitories. These buildings supply comfortable quarters at a low cost for 136 men.

Ballard Hall is the second women's dormitory owned by the college. At a cost to the state of only $12,000 it furnishes desirable accommoda-

tions for 45 women. If the new women's dormitory is completed in time for use in October, 1920, Ballard Hall may be temporarily converted into a men's dormitory.

Smith Hall was made possible by the generosity of Mrs. Shirley Onderdonk, of Durham, who gave $16,000 as a memorial to her mother, Mrs. Alice Hamilton Smith. The remainder of the cost, $10,000, was provided by the state. By the aid of the carpentry and concrete divisions of the S.A.T.C., an annex has been added to the rear of the hall, which greatly increases the rooming facilities. The hall now accommodates 68 instead of 32 women.

New Women's Dormitory.—Through the will of Mrs. Alice Hamilton Smith of Durham, a sum of money amounting to approximately $110,000 was received by the college. The board of trustees of the college at its January meeting voted to appropriate this fund for the purpose of constructing a women's dormitory. Plans have been made for this dormitory of Georgian style of architecture to conform to that already adopted for all the college dormitories. It is planned to accommodate approximately 100 students with rooms for the matron, large living rooms with a kitchenette adjoining, a laundry, and other features that will make it an efficient and attractive home for women.

Each dormitory has a large reception room for social use. A competent matron is in charge of each building.

The Health Service.—A house in the village has been acquired by lease as an infirmary for the care of students. A competent matron, who is also an experienced nurse has been secured, and the building has more than justified itself by its usefulness.

Hostess House.—Through the efforts of the New Hampshire Federation of Women's Clubs a large house in the village has been leased and fitted up as a hostess house. Friends of students and visitors to the college may obtain temporary accommodations at reasonable rates, and the parlors are open constantly for the benefit of students. Located in a small village with no hotel facilities, the college is fortunate indeed to secure the double advantage of accommodations for its friends and supervised assistance in promoting the social life of the student body.

Practice House.—A modern house owned by the college and conveniently located on the college campus has been fitted up as a practice house for home economics students. Here they live during six weeks of

their senior year, taking their turn at performing the varied household tasks under competent supervision.

Farm Buildings.—Besides the above, there are numerous farm and other buildings adapted to the needs of the several departments.

EQUIPMENT

Agronomy.—For the teaching of agricultural engineering, this department is provided with drainage levels for laying out drains, plane tables for making farm maps, polar planimeters for measuring plotted areas, a dynamometer and several other pieces of apparatus for studying draft problems. For farm crops work it has a very complete collection of dried specimens of the different forage crops, and the more important varieties of corn, wheat and oats. Seed testing apparatus, grass charts and other illustrative material form a part of the equipment.

The lecture room is equipped with a combined lantern and reflectoscope, together with a large number of lantern slides.

The soil physics laboratory contains soil bins, a compacting machine, chemical and torsion balances and various kinds of physical apparatus for the study of soils, including that for the determination of specific gravity and for the making of mechanical analyses.

The agricultural museum contains the original "Daniel Webster plow" and other primitive models. It also contains many of the latest types of farm machinery, including plows, cultivators, harrows, mowers, planters, corn and grain binders, a thresher, a tractor, manure spreader, a multiple hitch, various makes of woven wire fences, etc.

The college farm, with its 500 acres of land, has a variety of soils suited for the growth of various farm crops. Land on nearby farms is rented for the growing of corn and potatoes so that good opportunities are afforded for practical work and demonstration in the production of field crops.

Animal Husbandry.—The 1919 legislature appropriated $10,000 for a stock barn and $5,000 for livestock. The new barn which has just been completed consists of a two-story structure 40 x 65 feet with a one-story ell 32 x 60 feet and is thoroughly equipped with modern appliances. There are quarters for thirty head of sheep, eighteen head of cattle, and four horses. There are also foaling and calving quarters and a small hospital. A part of the main building is heated and contains quarters for student attendants. During 1918 a modern piggery, which accommodates twelve brood sows with litters, was erected. A

part of this building is heated and contains farrowing quarters, a feed room, a storage loft and attendant's room. In the Agricultural Building a large room is fitted up for the judging of livestock. The class room is provided with a stereopticon lantern and a large collection of lantern slides is used to show the leading individuals of the different breeds of livestock. The herd books of the most prominent breeds are used for the purpose of familiarizing the students with the methods of tracing pedigrees and with the practices of breeders' associations.

The college owns a number of horses of the draft type, including a well bred Percheron stallion and several mares and colts of the same breed. There are two small herds of beef cattle, milking Shorthorns and Herefords, and also good individuals of the Devon and Galloway breeds. For the study of sheep there is a flock of pure-bred Shropshires and for hogs a herd of Berkshires. There are also individuals of the Duroc Jersey and Chester White breeds.

Architecture and Drawing.—The department of architecture and drawing is well equipped to meet the needs of the subjects offered. The drafting rooms are supplied with tables and lockers and the free-hand studio with suitable stands and easels. For engineering and machine drawing there is an excellent collection of working models and machine parts, and various machines in other departments are available for this work. For free-hand drawing there is a good supply of geometric models, and for advanced work in charcoal drawing the nucleus of a good collection of plaster casts exists, consisting of historic ornament, details of plant and animal life and of the human form. For special work in this subject there is available the museum of casts, consisting of examples of antique and modern sculpture. For work in architectural drawing an excellent library of books and periodicals and blue prints of all classes of buildings are available for reference and use in the drafting rooms, while a goodly collection of samples of building materials is being added to from time to time.

Botany.—The department of botany has the usual laboratory equipment to meet the needs of the courses in general botany, plant physiology and bacteriology. In the advanced courses, owing to the connection of the department with the experiment station, students will find both the laboratory and greenhouse equipment ample for critical studies of plant diseases and plant nutrition.

Chemistry.—The several chemical laboratories are fairly well equipped. Each is supplied with most of the forms of apparatus required

for its particular work. Besides all necessary glass and porcelain ware, this includes water baths, drying ovens, combustion furnace, muffle and assay furnaces, platinum dishes and crucibles, polariscope, spectroscope, balances, lantern and other lecture appliances.

Dairy Husbandry.—The dairy husbandry department offers excellent opportunities for instruction in technical and practical dairy work. The college creamery has all necessary machines and equipment. Electric motors furnish power for the different machines. Milk from the college herd and milk and cream from nearby farms give sufficient material for the different laboratories. In the farm dairy room are hand separators and hand and small power churns. The milk testing and milk inspection laboratory is equipped with Babcock testers and other apparatus. The bacteriological laboratory has equipment necessary for instruction in dairy bacteriology.

The college dairy herd of 75 animals consists of representatives of the Guernsey, Jersey, Ayrshire, and Holstein breeds. Use is made of the herd for laboratory instruction in dairy husbandry subjects.

Electrical Engineering.—The laboratories for electrical engineering occupy the ground floor of the south end of DeMeritt Hall. The main laboratory is 104 feet by 36 feet and is used for testing dynamo electric machinery. In this main laboratory there is a large distribution switchboard on which are mounted instruments, switches, circuit breakers, a synchroscope and plugging devices so arranged that by making the proper connections thereto direct current and single-phase, two-phase and three-phase alternating current of different voltages and frequencies can be supplied to the various panels in the laboratory and to the lecture rooms in the building.

In addition to this main laboratory there are laboratories devoted to photometry, storage batteries, and high potential experiments. The laboratories are also provided with an instrument room, a mechanician's room and a photographic dark room.

The general equipment includes various dynamos and motors for direct and alternating current, transformers including a 75,000 volt high potential transformer, rectifiers, rotary converters, telephone and telegraph instruments, wireless telegraph apparatus, an Evans demonstration equipment, arc lamps, storage batteries, and the necessary measuring instruments adapted to the needs of students taking this course.

The lecture rooms of the department are equipped with small panel

boards connected directly to the switchboard in the main laboratory thus making it possible to supplement lectures with demonstrations.

The department has received as a gift from Sears, Roebuck & Co., of Chicago, Ill., one electric light plant consisting of engine, dynamo, switchboard, and storage battery. The department has also received as a gift from the Domestic Engineering Company, one of the Delco-light sets including engine, dynamo, switchboard and storage battery. Each of these outfits is of the 32-volt type adapted for isolated plant work. These outfits are available for demonstration, and also for laboratory experiments.

Farm Department.—New Hampshire College has a large, well-equipped farm. This farm serves as a laboratory for much of the instruction in agriculture where approved methods and practices may be seen and where the students may gain experience by actually performing the work with their own hands.

The college farm proper consists of about 385 acres of which about 100 are in forest and woodland; about 45 are occupied by the campus and athletic field; about 95 are tillage land, and about 145 are pasture land. A part of both the pasture and tillage land is utilized by the agronomy, horticulture, and animal husbandry departments.

A second farm of 120 acres adjacent to the main farm and having a complete set of buildings is occupied by the Horticultural Department. This farm contains one of the best orchard sites in this part of the state, about 20 acres of forest and about 50 acres of pasture.

A third farm of 315 acres, about 200 of which is meadow and tillage land, located within a mile and a half of the campus, has recently been leased primarily for the production of hay and forage crops.

The college farm buildings consist of a large dairy barn, a horse barn 36 x 68 with basement and hay loft, a new stock barn, two sheep barns, a new up-to-date piggery, and two general storage barns. The dairy barn has two 115 ton silos, storage capacity for about 120 tons of hay, and a well-appointed, sanitary stable accommodating 40 cows and the usual complement of young stock. A building 20 x 60 with individual yards is used for housing the herd bulls.

Forestry.—The demand for instruction in forestry at the college has been increasing from year to year and the legislature of 1911 provided for a separate department of forestry. The course is intended to provide not only a special training in forestry, but also a broad general training in other lines of agriculture closely related to it. For those who desire

to make forestry their life work, every encouragement and assistance will be given. Additional work at some graduate school of forestry is now almost a necessity, owing to the large number of men entering the profession.

Durham is well situated with reference to the study of woodlot forestry. All types of native second-growth forests are found nearby and the college owns a tract of 60 acres of old-growth timber where exceptional opportunities are given for the study of mature forests. There are other areas where practice will be given in establishing plantations of forest trees by various methods. A nursery for the growing of seedling forest trees has been established.

All the necessary instruments for making forest maps and measurements, together with collections of wood specimens, lantern slides and photographs, are available in connection with this work.

The senior class in the forestry course goes into camp for a period during the senior year in order to get practical experience in camp life and the survey, valuation, and management of large tracts of wood land.

Home Economics.—The home economics department is located in two large rooms in Thompson Hall. The food laboratory is fitted with work desks, storage cupboards and apparatus for cooking. The desks are built in cabinet form to hold the necessary utensils and materials for each student. Each table is fitted with both gas and electric stoves and ovens.

The cooking utensils are of the materials best suited to the use of each. Standard measuring apparatus and scales are provided.

A storage cabinet is provided with bins for supplies and cupboard space for large utensils.

The sewing equipment consists of sewing machines, cabinets, tables, and dress-forms.

Various educational exhibits, both food and textile, are owned and used by the department for illustrative purposes.

The reference library of books, bulletins and journals is deposited partly in this room and partly in the main library.

Mechanical Engineering Department.—This department is located in DeMeritt Hall. On the second floor is the drafting room which is given over to advance drawing and designing. In addition to the drafting room there are two lecture rooms, and department offices. One of the lecture rooms is equipped with stereopticon lantern and screen, so that illustrated lectures may be given at any time.

In the basement is located the Mechanical Engineering Laboratory, the north end of which is given over to a materials' testing room, in which are tested all kinds of building materials, oils, fuels, etc. The main room is given over to steam, gas and hydraulic testing. The equipment consists of three gasoline engines, two high speed steam engines, and one 25 H. P. Murray-Corliss. For hydraulic work there are various kinds of meters, weir tanks, and pumps. In addition to the laboratory equipment mentioned there is a supply of indicators, gages, thermometers and other small apparatus for testing and research work.

Military Department.—Recognizing in military training a source of physical, mental, and moral development for the individual and a future safeguard for the nation, the college maintains two units of the Reserve Officers Training Corps. This corps, which is described in the later pages of the catalog, consists of over fifty thousand students in all of the principal educational institutions of the country. It was organized by congress in 1916 to provide systematic military training in civil institutions and to train specially selected students as reserve officers in the military forces of the United States.

The training of the corps is under supervision of the Secretary of War. Officers and non-commissioned officers of the regular army are detailed at the college for carrying on this training. The War Department loans to the college all the necessary equipment of the latest type so that with the exception of a few text-books required by advanced students, members of the R.O.T.C. are put to no expense for arms or equipment.

In addition to that infantry and artillery equipment furnished by the government, there is a 20 yard indoor rifle and pistol gallery, and a 200 and 300 yard rifle range available for the use of students. The rolling country in the vicinity of the college furnishes opportunity for extended order drill and field exercises, and the athletic field for close order drill.

The cadets wear, when on duty of a military character, an olive drab cloth uniform as prescribed by standing orders of the War Department. This is furnished by the government.

Upon the graduation of each class the names of those students who have shown special aptitude for military service are reported to the adjutant-general of the army, and to the adjutant-general of the state, and they receive a special certificate for military proficiency.

Physics.—Besides the necessary furniture, the department is supplied with the usual small tools, calipers, scales, balances, weights, hydrometers, calorimeters, thermometers, etc., and with other apparatus for the performance in the laboratory of experiments in mechanics, heat, sound, light, magnetism and electricity.

The lecture room has a small but growing collection of apparatus for the illustration, both experimentally and with the projection lantern, of the laws of matter and energy in their various relations, and of the history of physics. There has recently been added to the lecture equipment a set of the well-known Evans P. E. D. equipment, which makes it possible to illustrate most of the phenomena in electro-dynamics which are treated in general physics.

Instruction is carried on by means of lectures with stencil outlines furnished to students and constantly kept up to the development of the subjects, recitations and discussions based on standard text-books, and experimental work in the laboratory. Stencil outlines are furnished for the laboratory experiments, with concise directions and references, and reports on the results of their experiments are written by the students for examination and criticism by the instructor.

The physics department occupies most of the west end of the engineering building. In the basement there are two small rooms for individual work, a switchboard room, a room for storage battery and for chemical work, a storage room, and a large laboratory room for work in subjects yet to be developed. On the first floor are the general laboratory, partly divided off into small rooms for work in light or for balances, a room for apparatus storage, the office and a recitation room. On the second floor are the lecture room and a room for the storage of lecture apparatus.

Poultry Husbandry.—The equipment of the poultry department consists of a permanent laying house, accommodating 750 hens, and eight colony houses used to brood chicks and also for housing 250 laying hens. The birds kept number 1,000 and consist of White Leghorns, White Wyandottes, Barred Rocks, and Rhode Island Reds. The plant is run on a strictly commercial basis and all the laboratory work of the various poultry courses is practical in every way, giving the student actual work in the various operations of a commercial poultry plant. There are 17 incubators of three standard makes, illustrating the differences in the various forms. There are also eight colony brooders of five different makes by means of which the student can see the operation of the various kinds.

Shopwork.—The wood shop is equipped with thirty-three benches and complete sets of tools for 160 students. Each bench is equipped with modern vises. Other equipment consists of a universal pattern maker's saw, board-planer, buzz-planer, band saw, speed-lathes and a large pattern maker's lathe with boring attachment.

The equipment of the machine shop consists of engine lathes, speed-lathe, vertical drill, planer, large universal milling machine, plain milling machine, shaper, power hack saw, tool grinder, twelve benches with vises and bench lathes and a large number of small tools, including micrometers, calipers and gages necessary for accurate work.

In the forge shop are seventeen Sturtevant down-draft forges with anvils and necessary tools. The blast to the forges is furnished by a No. 4 blower, and the smoke is carried away by a 60-inch exhauster. These are driven by an electric motor.

Zoölogy.—The college is favorably situated geographically for the study of zoölogy. Within a few minutes' walk of the laboratory, the Oyster river meets the tide water from Great Bay. This furnishes a graduation of salt, brackish and fresh water with an abundance of their characteristic fauna. Great Bay, the Piscataqua river and the open ocean are within easy access, and have their own peculiar, characteristic forms. On the other hand, there are numerous bodies of fresh water, with typical fresh water forms.

The department of zoölogy is prepared to offer courses in the following subjects: (A) systematic zoölogy; (B) physiology and sanitation; (C) philosophical zoölogy; (D) anatomical zoölogy.

The equipment for the work in systematic zoölogy consists of a well-lighted laboratory, provided with tables, charts, dissecting and compound microscopes. All of the latest books and periodicals on systematic zoölogy are at the student's disposal. The lecture room is fitted with a new reflectoscope capable of projecting opaque objects, text-book figures or lantern slides. The room has a seating capacity of eighty, and is provided with tablet armed chairs which enable the students to readily take down notes and drawing. There is a fairly complete collection of local invertebrates, and a very good collection of the birds of New Hampshire. The work in systematic entomology is greatly aided by a large and complete collection of insects which is the property of the experiment station.

The proximity to both salt and fresh water renders the work in advanced systematic zoölogy unusually attractive. In addition to the

regular collecting equipment, nets, aquaria, etc., advanced students also have the use of rowboats and a gasolene launch.

In the work in physiology, hygiene and sanitation, the department is provided with an unusually fine collection of injected preparations of the human body, and with numerous charts. The same laboratory and equipment is used in this work as noted above.

For work in evolution and experimental zoölogy the department has a very complete library. Studies in ecology in Great Bay and vicinity are encouraged, for which purpose the students have the use of a camera equipment. In addition to the study of evolution under natural conditions the department also furnishes aquaria for laboratory study and experiments.

The work in anatomical zoölogy is greatly facilitated by an abundance of fresh material which may be collected as needed. For the study of human and comparative anatomy a full set of skeletons and preserved material is provided. Students interested in histology have access to a private collection of some two thousand microscope slides.

Museum.—The museum had for a nucleus the collection made during the state geological survey. To this, additions have been made from various sources. Specimens are being collected to illustrate the zoölogy of New Hampshire, and New Hampshire collectors and naturalists are invited to make the museum the permanent depository of their collections.

GENERAL INFORMATION

COURSES

The college is closely related to the public school system of the state, continuing the work of the high school, and it is open to both men and women. In accord with the origin and function of the college, its courses are essentially practical, leading directly to the student's preparation for a successful livelihood.

I. Agricultural Division.

a. Four-Year Courses.

1. Animal Husbandry and Dairying.
2. Forestry.
3. Horticulture.
4. Teacher-Training Course in Agriculture.

b. Two-Year Course in Agriculture.

c. Farmers' One-Week Course.

II. Arts and Science Division.

a. Four-Year Courses.

1. General Arts and Science.
2. Home Economics.
3. Arts Course in Chemistry.

III. Engineering Division.

a. Four-Year Courses.

1. Chemical Engineering.
2. Electrical Engineering.
3. Mechanical Engineering.
4. Architectural Construction.
5. Industrial.

EXPENSES

Estimate of Freshmen Expenses

	High	Average	Low
Tuition	$75.00	.....	.....
Fees	36.00	$36.00	$36.00
Books	25.00	20.00	18.00
Room	100.00	90.00	65.00
Board	300.00	240.00	200.00
Laundry	30.00	15.00	4.00
Uniform*	.....	.....	.....
Incidentals	50.00	20.00	10.00
Total	$616.00	$421.00	$333.00

Tuition and Fees.—Tuition is $75 a year; incidental fees are $36 a year. They are payable in advance in three equal installments, one on the first day of each term. A diploma fee of $5 is charged upon graduation. Charges will be assessed for extraordinary breakage or damage. No laboratory or course fees are charged. Payment of the incidental fees entitles the student to admission to all athletic games and contests.

Books.—Students may purchase at cost all books, drawing instruments, materials, etc., at the college bookstore in Thompson Hall.

Rooms.—The college has two dormitories for women and three for men. All rooms are heated, lighted and furnished. Bed linen, quilts and towels, however, are provided by the individual students. Each woman's dormitory is equipped with a laundry. In most cases, two students occupy a room or suite of rooms. Prices range from $66 to $108 a year for each student. Applications for rooms in the dormitories should be made directly to Mr. O. V. Henderson, business secretary of the college. Early application is necessary in order to secure a choice of rooms. Rooms in private families may be secured for about the same prices as for those in dormitories. Less desirable, but comfortable, rooms may be obtained by men in several private dormitories at a somewhat less figure.

Women students, unless living at home, are required to room in one of the women's dormitories, or in approved houses.

* Uniform for members of the Reserve Officers' Training Corps is provided by the federal government. A deposit of $15 is required.

Expenses for travel, clothing, etc., vary with the individual student.

Board.—The new Commons provides boarding facilities for the entire student body. During 1919–1920, the rate for board in the main dining room has been $6.00 to $6.50 a week. Unless there is a decline in prices, it will probably be necessary to increase this price for 1920–21.

COLLEGE AIDS TO STUDENTS

Scholarships.—Scholarships are awarded annually for the purpose of aiding deserving students. Recently, the large increase in student attendance has utilized to the full all scholarships thus far provided. However, the trustees are anxious to supply scholarships to all really needy young men and women in New Hampshire. In order to do this, they necessarily require full information of all applicants in order that the benefits may be awarded most equitably.

These scholarships will be forfeited at any time for misconduct, or for the use of intoxicating liquor or tobacco. They will also be withdrawn from students in all four-year courses who fail to secure an average grade of sixty in any one term, and, only in cases of special financial necessity, will they be restored by the president.

Conant Scholarships.—There are twenty-four Conant scholarships, each paying tuition, $75; fees, $36;—total, $111. These are assigned under the following conditions:

They are to be given to young men taking agricultural courses.

Each town in Cheshire County is entitled to one scholarship, and Jaffrey is entitled to two.

They will be reserved for their respective towns until August 1 of each year. Those not taken by students from Cheshire County, and those in excess of the number of towns, will then be assigned to agricultural students from other parts of the state, and may be divided at the discretion of the president. These scholarships are assigned annually and are good for one year only.

Senatorial Scholarships.—There are twenty-four senatorial scholarships, one for each senatorial district. They are at the disposal of the senators from these districts. These scholarships are to be assigned each year and are good for one year only. Each one pays the tuition of $75. The method of appointment is entirely at the option of the senator concerned and may be by election, competitive examination, or otherwise. It is hoped, however, that preference will be given to needy applicants. These scholarships are open to students in all courses, but are restricted to residents of the state.

Grange Scholarships.—In order to equalize to some extent the distribution of scholarships throughout the state, a scholarship paying tuition of $75 has been placed at the disposal of each subordinate and Pomona Grange in New Hampshire, for the use of a four-year or two-year student. These scholarships are to be assigned each year and are good for one year only. The method of appointment is entirely at the option of the grange; it may be by election, competitive examination, or otherwise. It is hoped, however, that preference will be given to needy applicants. Holders of these scholarships need not be members of the grange, but must be resident within the state, and within the jurisdiction of the appointing grange, or of that adjacent thereto.

Valentine Smith Scholarships.—Through the generosity of the late Mr. Hamilton Smith of Durham, the sum of $10,000 has been given to establish the Valentine Smith scholarships.

"The income thus accruing to the college shall be given to the graduate of an approved high school or academy who shall, upon examination, be judged to have the most thorough preparation for admission."

These scholarships yield $100 annually and will be forfeited if an average rank of 75 per cent. is not maintained for each term.

Competitive examinations for this scholarship will be held June 29 and 30 in Durham, Keene, Laconia, Lancaster, Manchester and West Lebanon. Contestants must present credentials fulfilling the requirements for entrance to the college and must pass examinations in English, American history, algebra through quadratics, plane geometry and either physics or chemistry.

Requests for examinations should be forwarded to the Dean of the College at least one week before the beginning of the examination period, and must state the names and addresses of the students, the places at which they will present themselves, and the examinations desired.

Examinations are not restricted to residents of the state.

State Scholarships.—By an annual scholarship appropriation of $3,000, the state provides free tuition for forty New Hampshire students. These scholarships are awarded annually strictly on the basis of financial need, and are good for one year only. Applicants must furnish full information in relation to their own financial status and that of their parents.

Loan Fund.—By a very satisfactory arrangement with the trustees of the "Pearson Fund," the college will receive each year a substantial sum to be loaned to needy students who are economical in their expenditures and who are working to pay a portion of their college expenses.

As the amount received is limited, loans will be granted usually to upperclassmen only. Emergency cases will, however, be considered on their merits.

All loans will be secured by notes, bearing interest after graduation or leaving college, but no additional signatures or security will be required. When repaid the money will pass into a revolving fund which will be limited strictly to loan fund purposes.

Prizes.—*Bailey Prize.*—Dr. C. H. Bailey of Gardner, Mass., and E. A. Bailey, B.S., of Keene, N. H., offer a prize of ten dollars for proficiency in chemistry.

Erskine Mason Memorial Prize.—Mrs. Erskine Mason of Stamford, Conn., has invested one hundred dollars as a memorial to her son, a member of the class of 1893, the income of which is to be given, for the present, to that member of the senior class who has made the greatest improvement during his course.

The Inter-Fraternity Scholarship Cup for Men is given annually to that fraternity whose general average for the year is the highest and shall remain in the custody of the fraternity winning the cup for one year or until such time as it may be awarded upon the same basis to another fraternity. At the end of ten years the cup shall become the permanent property of that fraternity to which it has been awarded the greatest number of times.

The cup was originally given by the fraternities for the purpose of increasing interest in higher scholarship and raising the standard of scholarship in the fraternities.

The Inter-Fraternity Scholarship Cup for Women was given by the Alpha Xi Delta fraternity to the women's fraternity having the highest average in scholarship throughout the year. At the end of five years it is to be given to that women's fraternity which has held it the greatest number of times out of the five.

The New Hampshire College Military Honor Medal.—This medal is made possible through the generosity of Major S. G. Eaton and the members of the S.A.T.C., on duty at the New Hampshire College in December, 1918. Article 2, of the special order announcing the gift reads as follows:

"From the sum of money given to the college there shall be expended each year a sufficient amount to purchase an appropriate gold medal. The said medal will be awarded to that student of New Hampshire College having taken military training during the preceding year and

having proved himself in the opinion of the board above provided to be the best soldier. The Student's Army Training Corps wishes it to be clearly understood that it does not wish the medal awarded on a basis of perfection at drill but rather on the strength of such qualities as physique, force of character, energy, mentality, courage, leadership, and in general such characteristics as advertise the owner to be of greatest value to his country in a military sense in the advent of another war."

Chase-Davis Memorial Medals.—In the spring of 1909 the Glee Club voted to present a gold and a silver medal yearly to the college in memory of Carl Chase, '09, of Webster, an enthusiastic member of the New Hampshire football team and the Glee Club, and of John Worthen Davis, '11, of Concord, who were drowned in Great Bay, December 7, 1908.

According to the terms of this gift, the gold medal is to be awarded to the senior who has won an "N. H." and stands highest in his studies, and the silver medal is to be awarded to the senior who has won an "N. H." and stands second in his studies. These medals are for excellence in athletic competition primarily, and the number of times a man wins an "N. H.," during his college career shall be of importance in making the award.

Chi Omega Prize.—The Chi Omega Sorority of New Hampshire College offers a prize of ten dollars for the best thesis on a sociological subject written by a woman student in Sociology 3-a, 4-b or 5-c.

Phi Mu Medal.—The local chapter of Phi Mu offers a gold medal to the senior girls, to be awarded on the following basis: 50 points for excellence in physical education, determined both by skill and the spirit in which the work is carried. The remaining 50 points must be satisfied by evidence of unusual scholastic capacity, democracy, loyalty, and helpfulness in college associations and activities. No candidate will be considered who does not have an average grade for her college work above 80.

Lillian S. Edwards Prize.—A fund has been provided by Mrs. Lillian S. Edwards of Sanbornville for the publishing and distribution of the best thesis on a sociological subject written by a student for the Department of Sociology during the second term of the college year.

The Hood Prize for Dairy Students.—Through the kindly interest and generosity of Mr. Chas. H. Hood of Boston, who was graduated from New Hampshire College in 1880, cash prizes of $60, $45, and $30 will be awarded in October, 1920, to the three students selected by the Dairy Husbandry Department to represent the college in the Intercol-

legiate Dairy Cattle Judging Contests held annually at the National Dairy Show in Chicago.

The awards will be based upon the final standing of the students in a series of competitive judging contests conducted by the Dairy Husbandry Department during the spring in the subject of dairy cattle judging and during the early fall in the subject of milk production. These prizes are intended to promote interest in the judging of dairy cattle and are to be used to defray in part the expenses of the trip to Chicago.

Self-Support.—Students obtain considerable financial aid by janitorships, by table work at the Commons, and by work on the farm and in the greenhouse. They also find employment with the power and service department of the college and with the experiment station. However, so much depends upon the individuality of the student that the college can guarantee nothing in any particular case, but is glad to assist by informing students of opportunities for work.

STUDENT ORGANIZATIONS

The Student Council is an organization of senior students, one from each fraternity and one from the non-fraternity men, which regulates intermural activities.

The Girls' Council includes in its membership all of the women students of the college. To this organization are brought for settlement numerous problems pertaining to the general welfare of the girls.

The Girls' Advisory Council is a committee of eleven girls, consisting of delegates from each women's organization in college, who meet monthly to discuss with the dean of women matters relating to the welfare of the women students.

The Young Men's Christian Association is organized for the purpose of promoting Christian leadership. The various activities of the organization are carried on through a large committee known as the friendship council. Some fifty of the leaders on the campus make up this council. A full time secretary, who also acts as interdenominational student pastor, is employed by the advisory board of the Y.M.C.A. He works with the students in promoting Christian character building on the campus. Among the activities of the "Y" are discussion groups, deputations, Rural Sunday School leadership, Americanization work, moving pictures, employment bureau, special meetings and conferences.

The Young Women's Christian Association through its cabinet and large membership conducts a number of discussion groups, promotes social service work, annually sends a large number of delegates to the summer conference at Silver Bay, N. Y., and is active in general meetings in coöperation with the Y.M.C.A.

The New Hampshire Young People's Organization, a movement of, for, and by the students, meets each Sunday evening at the Community Church to discuss vital religious topics and campus problems. A social hour is always enjoyed in connection with these discussions.

The New Hampshire College Athletic Association is an organization composed of faculty members and students of the college. Every undergraduate student automatically becomes a member of the association upon enrollment in college by paying the college fees. This entitles each student to free admission to all home athletic games.

The New Hampshire Club is an organization of the letter men of the college banded together for the betterment of athletics in general, publicity of the institution and coöperation of the student body.

The Men's Glee Club is an organization formed for the purpose of assisting in the development of music and in the bringing together those men of the college who have ability to sing or who desire to develop their voices. Candidacy for the club is open to all men students of the college. It is customary each year for the club to take an extensive trip through the state, visiting many cities and towns and giving concerts in each.

The Girls' Glee Club was established for the purpose of promoting interest in, and knowledge of, choral singing. It has been the custom of the organization to give operettas or Shakesperian plays at Commencement time, besides the annual concerts given in the middle of the year. Invitations are accepted from time to time to give concerts in surrounding towns and cities.

The New Hampshire College Orchestra is an organization formed for the purpose of furthering the musical ambitions of students desiring such an opportunity.

The Agricultural Club is the common meeting-ground of all the agricultural students. Its primary object is to discuss agricultural topics of scientific interest and to familiarize its members with the use of parliamentary law. An incidental object is to secure the social and

literary advantages of a club organization. It has a large and well equipped club room on the third floor of Morrill Hall.

The Book and Scroll is a literary society which was organized in 1915, at the suggestion of Dr. E. A. Richards, by a small group of girls who desired to found an organization for the study of poetry. It is an honorary society, membership being granted only to those seniors and juniors who attain an average of 80, or over, in English. Two contests are held each year, one of these being an original poetry contest. The open meetings are in charge of different members of Book and Scroll and interesting programs dealing with the works not only of classical poets but also with those of more modern writers are enjoyed.

The Economics Club was organized in 1915. Its purpose is to bring together students who are interested and are specializing in the study and the furtherance of economics. Meetings are held twice a month.

The Engineering Society was organized in 1915. Its membership includes students in engineering and the engineering faculty. The object of the society is to get its members in touch with various engineering problems for which time seldom allows discussion in the class room. This is accomplished through lectures by professional men, student demonstrations, and motion pictures furnished by manufacturing concerns. At least two meetings each year are devoted to promoting fellowship among the members.

Alpha Chi Sigma was founded at the University of Wisconsin in December, 1902. It is composed of men who are to take up some branch of chemistry as their life work. Mu chapter was established in New Hampshire College in 1911.

Alpha Zeta is the professional fraternity of agricultural students in New Hampshire College. "Granite" chapter was organized here in 1903. It is not a social fraternity and no student is eligible until after the first term of his sophomore year. Membership then is conditional upon the student's ranking in the upper two-fifths of his class and upon his future promise of a successful career in some line of agricultural work.

Phi Gamma, an honorary biological fraternity, was organized in 1916 by Professor Jackson and several others who were interested in research work in zoölogy and other allied subjects. The purpose of the fraternity is to promote high scholarship and special study for the advancement of these sciences. Four regular meetings are held each month, two of which are devoted to scientific discussions.

Phi Lambda Phi was organized by the department of physics in 1919. The members are students of high standing who are interested in some phase of physics. The object of the club is to hold discussions intended to result in a broader understanding of physics and to create a sense of good fellowship between instructor and student.

Le Cercle Francais, an honorary society, was established in the spring of 1919 to offer competent students an opportunity to acquire a speaking knowledge of the French language and to awaken a real interest in all things pertaining to the French nation.

Casque and Casket was organized in 1915 by representatives of the fraternities who felt that the influence of the several fraternities could be strengthened if a closer union between the fraternities could be secured. The fraternity is composed of students of the upper classes, having an equal number of members from each fraternity associated together to lend what influence and assistance is possible in the advancement of the college interests. There are now six national fraternities represented in the membership.

Pan Hellenic, established in 1905, is an organization which transacts all business of common interest to the four women's fraternities. Every year each fraternity sends two representatives to Pan Hellenic.

STUDENT REGULATIONS

The following are a few of the student regulations that should be carefully noted. Students are held accountable for all student regulations.

Physical Examination.—A physical examination must be passed by all students before registration.

Registration.—Undergraduate students are required to register before 4 p. m. of the first day of each term.

Any former student who registers after the first day of a term will be charged for such registration a fine of one dollar for the first day and fifty cents additional for each succeeding day, to be remitted only by the president upon presentation by the student of a substantial excuse for delay.

Every student is responsible for all work assigned him on his registration card, and no credit will be given for any subject unless the student is registered for the same.

Changes in Schedule.—A student may add or drop an elective subject only upon the approval of his faculty adviser during the period

intervening between the day he registers and 6 p. m. of the fifth day following. A student, in making changes in his elective slip shall have them approved (on a "drop and add card") by his faculty adviser, and said card must be filed with the registrar. After the fifth day following his registration, no changes can be made by a student without the consent of the Dean of his division.

Substitutions.—A substitution for a required subject may be permitted only for special reasons, and then only upon consideration by the department concerned and the proper division committee, and with the approval of the faculty.

Convocation.—Every student is expected to attend Convocation and all class exercises in the subjects for which he is registered and will be held responsible for all the work given in these subjects.

Vacations.—A student absent from a class exercise immediately preceding or following a scheduled holiday or vacation period shall be subject to a fine of $5 unless permission for the absence has been previously granted by the proper division committee.

Loss of Standing.—No student shall be registered in any class until he has completed three-fourths of the work of the preceding year and all the work required up to the beginning of that year. Any student who receives failures in nine or deficiencies in twelve credit hours during any one term shall thereby cease to be a member of the college. He can be re-admitted only upon recommendation of the reinstatement committee and an affirmative vote of two-thirds of the faculty present.

Eligibility.—Any student who receives official warning that he is below 60 in more than seven credit hours per week, or who has received deficiencies in more than seven credit hours during the preceding term shall not participate in class or college athletic contests, be manager of any team, or represent the college in any other public capacity. A warning in any subject shall hold until the term grade for that subject is in the hands of the registrar.

Grades.—Sixty is the passing grade of the college. Any mark below sixty shall be called a "deficiency." "Deferred" denotes that work is incomplete on account of illness or on account of an excuse which has received the approval of the faculty, and that it will be graded later. Every condition and every deferred mark shall lapse into a failure if it is not made up before the end of the following term.

METHODS OF ADMISSION

New Hampshire College will admit without examination all candidates who are graduates of high schools or academies of New Hampshire that are approved by the State Board of Education, provided the division entrance requirements of the college are met.

Graduates of schools specially approved by the college will be admitted on the same terms as graduates of approved schools in New Hampshire.

Graduates of other high schools and academies will be admitted on passing examinations in fifteen units. However, the college can not agree to give examinations in certain vocational subjects involving mainly practical work. Instead, it may require special certification in such subjects.

Cases not covered by the above statements will be decided by the entrance committee of the faculty.

Candidates for advanced standing are admitted on the basis of the work completed at the institutions from which they come.

DIVISION UNIT REQUIREMENTS

There are three divisions of New Hampshire College: the Agricultural, the Arts and Science, and the Engineering. These divisions are defined and described elsewhere in this announcement.

An entrance unit represents one study of four or five recitations a week for one year. It is assumed that two hours of manual training or laboratory work are equivalent to one hour of classroom work.

Candidates for admission to the freshman class of the various divisions of the college must show evidence, either by credentials or by examination, that they are prepared in fifteen units as indicated in the following table:—

Required Units	Agricultural Division	Arts and Science Division	Engineering Division
Group A English,	3	3	3
**Group B* Mathematics,	2	2	3
Group C Social Science and History,	1	1	1
Group D Natural Science,	1	1	1
	7	7	8
Elective Units	8	8	7
Total for admission,	15	15	15

Group E Foreign languages, ancient or modern.

Group F Vocational subjects: agriculture, commercial subjects, domestic arts, mechanic arts.

Elective units may be offered from groups A, B, C, D, E and F.

The credentials to be rendered by principals must state the time of graduation, the subjects studied, the number of entrance units in each, the grades attained by the student and the passing grade of the school. The credential forms to be used will be furnished by the college on application to the registrar.

Entrance by Examination.—Examinations will be given at the college at the time of opening in September. They will also be given in connection with the Valentine Smith examinations in June. Requests for these examinations should be forwarded to the Dean of the College at least one week in advance.

ENTRANCE REQUIREMENTS

GROUP A. ENGLISH

The examination paper in English will be based upon the principle that the way to learn to write is to read.

All candidates will therefore be required to write a series of short

* A candidate for admission to the Arts and Science Division of New Hampshire College who offers two units in a foreign language may substitute for the two units required in Mathematics two additional units in subjects named in groups C, D and E above.

Candidates for admission to the Architectural Construction and Industrial courses of the Engineering Division may be admitted with two units of mathematics, provided a total of 15 units is offered.

themes which will show an adequate knowledge and thorough appreciation of certain great English classics as literature—as "the life blood of the mind." The classics selected are as follows: Shakespeare's Merchant of Venice, Henry V, and Macbeth; one novel each by Scott, Dickens, George Eliot, Stevenson, Cooper and Hawthorne; one essay each by Macaulay, Ruskin and Lowell; the subject-matter and nature of the poetry of Wordsworth, Byron, Tennyson, Longfellow and Whittier.

As a special test in spelling, grammar, punctuation and paragraphing, the candidate will be required to write a short theme upon some subject pertaining to the home or school life of the average high school senior.

An optional question will be offered for the purpose of discovering the candidate's familiarity with the best modern periodical literature.

GROUP B. MATHEMATICS

1. **Elementary Algebra.**—The four fundamental operations for rational algebraic expressions. Factoring, determination of highest common factor and least common multiple by factoring. Fractions, including complex fractions, and ratio and proportion. Linear and quadratic equations, both numerical and literal. Problems depending on linear and quadratic equations. Radicals, including the extraction of the square root of polynomials and of numbers. Exponents, including the fractional and negative.

2. **Advanced Algebra.**—The formula for the nth term and the sum of the terms of arithmetical and geometrical progressions, with applications. The theory and use of logarithms, without involving the use of infinite series. The binomial theorem for positive integral exponents. Complex numbers, with graphical representation of sums and differences. Determinants limited to simple cases. The elements of the theory of equations.

3. **Plane Geometry.**—The usual theorems and constructions of good text books, including the general properties of plane rectilineal figures; the circle and measurement of angles; similar polygons; areas; regular polygons, and the measurement of the circle. The solution of numerous original exercises, including loci problems. Applications to the measurement of lines and plane surfaces.

4. **Solid Geometry.**—The usual theorems and constructions of good text books, including the relations of lines and planes in space; the

properties and measurement of prisms, pyramids, cylinders and cones; the sphere and the spherical triangle. The solution of numerous original exercises, including loci problems. Applications to the measurement of surfaces and solids.

5. Plane Trigonometry.—The subject-matter of plane trigonometry as presented in good text books, including the solution and use of trigonometric equations of a simple character, the use of logarithms, the solution of right and oblique triangles, and practical applications.

6. Review Mathematics.—A general mathematics review during half of senior year is recommended, especially for students preparing for college engineering courses. A certificate covering the work of not more than one unit will be accepted for entrance. No examinations will be given.

GROUP C. SOCIAL SCIENCE AND HISTORY

This group includes history, political economy, and commercial law.

Although there are excellent text books in history, an adequate preparation can not be obtained by text-book work alone. Some collateral work is necessary, whatever text book is used, and with certain text books a large amount is necessary. The details of the preparatory work in history are fully stated in "A History Syllabus for Secondary Schools," by the New England History Teachers' Association, published by D. C. Heath & Co., Boston, 1904. Details are also stated in "Standard Program for the Secondary Schools of New Hampshire, Department of Public Instruction, Concord, N. H."

1. Ancient History.—This may include the earliest nations and the period to 800 A. D., or it may be limited to Grecian History and Roman History to the fall of the Western Roman Empire.

2. Mediaeval and Modern History.

3. English History.

4. American History and Civics.—The work may conform to the course in American constitutional history described in the "Standard Program" or to the course in American history developed in nearly a hundred pages of the "Syllabus." It is assumed that in any case a reasonable amount of time is to be given to the study of the Constitution of the United States.

5. Political Economy.—(1) The study of a standard text. (2) At least six topics investigated by outside reading.

6. Commercial Law.—(1) Study of a standard text. (2) The study of a total of not less than thirty-six specific cases.

GROUP D. NATURAL SCIENCE

A notebook, carefully kept and examined by the teacher, is an essential part of all laboratory work in science.

1. Botany.—The work in botany should consist of (1) the study of a standard text; (2) four or five exercises per week, at least one of which should be laboratory work. Either a half or the whole of a year's work will be accepted.

2. Chemistry.—Elementary inorganic chemistry should cover the more common nonmetallic and metallic elements with their most important compounds, together with an introduction to the general theoretical principles; calculations based upon changes of gaseous volumes and chemical equations. A year's work should consist of four or five exercises per week, at least one of which should be laboratory work.

3. Physics.—The standard work in physics should consist of (1) the study of a standard text; (2) not less than forty experiments worked out in the laboratory by each student and properly recorded in a suitable notebook.

4. Zoölogy.—A study of the fundamental principles of animal structure and the dissection of type forms. The student should become familiar with the characteristics of the various phyla of the animal kingdom. The study should consist of four or five exercises a week, at least one of which should be laboratory work. Either a half or the whole of a year's work will be accepted.

5. General Science.—To meet a recent movement in the disposition of the science work in the high schools, a course in general science which amounts to at least four exercises a week for one year will be accepted. Such a course may include something of the biologic and earth sciences, the sciences employed in household economy, and the more common phenomena of physics and chemistry.

GROUP E. FOREIGN LANGUAGES

1. French.—Work of the first year should include (1) careful drill in pronunciation, (2) drill upon the rudiments of grammar, (3) abundant translation of simple English prose into idiomatic French, (4) reading of

from 100 to 175 pages of French prose, (5) writing French from dictation. Work of the second year should include (1) the reading of from 250 to 400 pages of easy modern prose, (2) constant practice in translating from English into French variations of the text read, (3) frequent paraphrases of the text read, (4) dictation.

2. **German.**—Work of the first year should include (1) careful drill in pronunciation, (2) drill upon the rudiments of grammar, such as the inflection of the articles, the common nouns, adjectives, pronouns and strong and weak verbs; upon the uses of the prepositions, the modal auxiliaries, and the rules of syntax and word order, (3) writing from dictation, (4) the reading of from 75 to 100 pages of prose, (5) translation from English into German. Work of the second year should include (1) the reading of from 150 to 200 pages of prose, (2) constant practice in translating from English into German variations of the text read, (3) dictation, (4) continued drill upon the rudiments of grammar, (5) frequent paraphrases of the text read.

3. **Latin, Elementary.**—Grammar and four books of Caesar. Two years' work.

4. **Latin, Advanced.**—Virgil, six books. Cicero, six orations.

GROUP F. VOCATIONAL SUBJECTS

1. **Agriculture.**

Agronomy.—A text-book or lecture and recitation subject upon the formation, classification, composition, physical properties and tillage of soils; the kinds, use, value, and function of different chemical fertilizers; the use, composition, and preservation of farm manures; the planting, cultivating, harvesting, use, and marketing of the different kinds of field crops. The text-book and lecture work should be supplemented by field and laboratory exercises. Four or five periods per week for one year.

Animal Husbandry and Dairying.—A text-book and recitation subject upon the types and breeds of horses, cattle, sheep, swine, and poultry with practical exercises in stock judging; a study of the principles of feeding, the classification of animal foods, with practice in computing and mixing rations. Also a subject upon the composition, properties, care and handling of milk, with practical exercises in testing milk, cream, and butter with the Babcock test. Four or five exercises per week for one year.

Horticulture.—A text-book or lecture and recitation subject upon the

classes and varieties of fruits; the location and fertilization of orchards; the pruning, grafting, and spraying of fruit trees, with some study of fungous and insect pests. Practical exercises in picking, packing, and marketing of fruit. Also a study in vegetable growing, in which each student learns the classes, varieties, uses, and adaptations of our most important vegetables. Practical gardening work in growing vegetables. Four or five exercises per week for one year.

Rural Economics and Farm Management.—A text-book, lecture and recitation subject upon the economic relations of land, labor, and capital. A detailed study of the cost of producing and marketing farm and garden crops. Also a study of the business end of farming, buying and selling methods, types of farming, systems of rotation, the keeping of farm accounts, and the making of inventories. Four exercises per week for one year.

2. **Commercial Subjects.**—Bookkeeping, commercial arithmetic, commercial geography, stenography, and typewriting.

3. **Domestic Arts.**—Foods and cookery, dressmaking, household sanitation and mechanical appliances, household economics, household design and decoration.

4. **Mechanic Arts.**—Casting, drawing, forging, machine work, molding, pattern-making, woodwork.

SPECIAL COURSES

A mature student who is not a candidate for a degree may be admitted as a special student for one year upon the approval of the Entrance Committee and the Dean of the Division in which he desires to work. In addition, each application for a subject must have the approval of the head of the department whose work the applicant desires to take. No credit earned by a special student shall count toward a degree except upon recommendation of the Entrance Committee and the vote of the faculty.

REQUIREMENTS FOR DEGREES

ADVANCED DEGREES

Advanced degrees may be conferred upon candidates who have received the degree of B.S. from this college or from any institution of like standing upon the fulfillment of the following requirements:

Degree of M.S.—The successful completion of a course of graduate study pursued in residence and approved by the faculty of the college.

The preparation of an original thesis satisfactory to the faculty of the college.

Degree of M.E.—Professional experience of at least four years.

The successful completion of a course of graduate study approved by the Engineering Division Committee.

The preparation of an original thesis satisfactory to the faculty of the college upon some subject approved by the Engineering Division Committee.

For details concerning the regulations governing the conferring of degrees address Dean C. H. Pettee.

UNDERGRADUATE DEGREES

The college confers two undergraduate degrees: Bachelor of Science and Bachelor of Arts.

The degree of Bachelor of Science is conferred upon students graduating from the Agricultural Division, from the Engineering Division, and upon students graduating from the Arts and Science Division who have elected the Home Economics Course, the Arts Course in Chemistry, or who have majored in groups 2 or 3 of the General Arts and Science Course. The degree of Bachelor of Arts is conferred upon students graduating from the General Arts and Science Course who have majored in group 1.

Agricultural Division

The completion of 216 term hours. [210 term hours for students entering prior to the school year of 1918–1919.]

The completion of the studies required in one of the following courses:

(a) Animal Husbandry and Dairy Husbandry.
(b) Forestry.
(c) Horticulture.
(d) Teacher Training Course in Agriculture.

Students graduating from the four-year courses in agriculture must present to the dean of the division on or before the second Tuesday preceding commencement satisfactory evidence of having had practical experience in farm work, either through having lived on a farm for at least two years subsequent to the age of 12, or through having worked on a farm for at least six months subsequent to the age of 16.

Students graduating from the Forestry Course must have spent at least three months in practical forest work, which time will be counted as a part of the six months' requirement.

Arts and Science Division

(a) General Arts and Science

1. The completion of 204 term hours, of which a minimum of 17 shall be required each term.

2. The completion of English 1–a, 2–b, 3–c.

3. The completion of the military and physical culture requirements or their equivalent.

4. The completion of major and minor requirements as follows.

The Arts and Science courses are divided into three groups:

Group I.—Language, Literature and History: English, French, German, Latin, Spanish, History.

Group II.—Mathematics and Natural Science: Agricultural subjects,* Botany, Chemistry, Drawing, Geology, Home Economics, Mathematics, Meteorology, Physics, Zoölogy.

Group III.—Social Science: Economics, Education, Political Science, Psychology, Sociology.

Group Requirements

Each Arts and Science student shall elect at least 27 term hours in each of the above three groups.

Major Requirements

Each Arts and Science student shall, at the beginning of the third

* Agricultural subjects as part of minor only.

term of his second year, select a department to be known as his major department.

In this major department he shall complete 27 term hours in which he shall make a grade of 70 or better.

In case of departments in which less work is offered than the amount required for the major, the shortage may be made up from such other related departments as the head of his major department may prescribe.

Minor Requirements

Each student shall, with the approval of the head of his major department, elect, for a minor, 27 term hours of subjects related to his major.

Student Advisers

1. For Freshmen and First and Second Term Sophomores:

A committee of faculty members shall be appointed by the dean of the Arts and Science Division to act as advisers for freshmen and first and second term sophomores, and the elective slip of each student must be approved by a member of this committee.

2. For Third Term Sophomores, and for Juniors, and Seniors:

A student shall have for his adviser the head of his major department; provided, that in case a student majors in a department outside the Arts and Science Division, his elective slip shall also be approved by the dean of the Arts and Science Division.

(b) Home Economics

The completion of 204 term hours.

The completion of the subjects required in the Home Economics branch.

(c) Arts Course in Chemistry

The completion of 207 term hours.

The completion of the subjects required in the Arts Course in Chemistry.

Engineering Division

The completion of 216 term hours.

The completion of the studies in one of the following branches:

(a) Chemical Engineering.
(b) Electrical Engineering.
(c) Mechanical Engineering.
(d) Architectural Construction course.
(e) Industrial course.

THESES

The preparation of a thesis upon some subject connected with the work of the division may be required by the division committee of candidates for a degree.

The subject of a thesis, together with a written approval by the head of the department concerned, must be filed with the registrar within one week of the opening of the second term of the senior year. The thesis is to be submitted to the head of the department not later than the second Tuesday preceding commencement day.

It is to be typewritten or printed upon standard thesis paper, eight and one-half by eleven inches, medium weight, and must be neatly bound in black cloth and gilt-lettered on the first cover with title, name of author, degree sought, and year of graduation. This bound copy is to be filed and left with the college librarian before commencement day.

FOUR-YEAR COURSES

AGRICULTURAL DIVISION

FREDERICK W. TAYLOR, *Dean*

The courses of this division are designed for the general education and scientific training of students in the various economic branches of agriculture. The lecture and recitation work of the classroom is supplemented largely by practical exercises in the laboratories. Seminar studies are also given, especially for seniors and advanced students. During junior and senior years students may elect certain courses of study which will enable them to specialize in animal husbandry, dairy-husbandry, horticulture, or forestry. They may also specialize in preparation for teaching agriculture.

While the two-year course is intended to give the student as thorough training in the science and practical details of farm operations as the time will allow, it does not give that opportunity for a broad general foundation of pure and applied science which the four-year courses afford; the latter courses aim primarily to combine a college education with that of a technical vocation. Many of the graduates of the four-year courses return to the farm for the purpose of putting into practice the knowledge and training of their college work, and many of them are becoming successful and prosperous citizens of the community; others who have no farms of their own accept salaried positions as superintendents or foremen on the dairy, fruit or truck farms of large owners; still others take positions as teachers of science and agriculture in our secondary schools or as assistants in our agricultural colleges and experiment stations.

The Agricultural Division offers the following four-year courses of study:

Animal Husbandry and Dairy Husbandry Course.—This course is designed for those students who wish to specialize either in animal husbandry or dairy husbandry. Election of subjects between these two departments may be made throughout the junior and senior years. The dairy building with its complete modern equipment, and the addi-

tional subjects and increased facilities for instruction in the animal husbandry department, make this course especially attractive.

Forestry Course.—The forestry course offers to students who have entered the agricultural division an opportunity to specialize in forestry during the junior and senior years. This arrangement allows the student to devote a large amount of time to the various branches of forestry, but at the same time requires a foundation in agriculture and in the sciences upon which agriculture is based. The college forest of sixty acres of old-growth pine and hemlock, and other areas of natural and planted growth, furnish the laboratory for the forestry student. Ample opportunity is given to study the various forest problems on the ground as well as in the classroom.

Horticultural Course.—This course is designed for those students who contemplate making a specialty of some branch of horticultural work. Several advanced subjects in botany will be required, but during the senior year opportunity will be given to elect subjects in other departments. The horticultural department is well equipped with gardens, orchards, greenhouses and laboratories for the study of the different phases of this industry, especially fruit growing, which is so prominent in the agriculture of the state.

Teacher Training Course in Agriculture.—Under the provisions of the Smith-Hughes act New Hampshire College has been designated as the institution in this state for the training of teachers of agriculture. The course of study provided for this purpose requires that at least 40 per cent of the work consists of technical agricultural subjects, 20 per cent of subjects in related sciences, and 10 per cent of educational subjects, including special methods and eight to ten weeks of practice teaching in secondary schools. Students who have completed the prescribed course of study will be accredited as qualifying under the Smith-Hughes act, provided that in addition they have had:

(a) farm up-bringing prior to such course, or
(b) two years' agricultural experience, one of which is in a recognized agricultural enterprise on a commercial scale.

The rapidly increasing demand for teachers of agriculture in our secondary schools has indicated the necessity of training men especially for this important line of work, and the teacher training course is designed to meet the need.

FOUR-YEAR COURSES

AGRICULTURE

ALL COURSES

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
Breeds of Live Stock (A. H. 1–a)	4		
Survey of Agriculture (Agric. 1–b)		1	
General Botany (Bot. 1–a, 2–b, 3–c)	3	3	3
Inorganic Chemistry (Chem. 1–a, 2–b, 3–c)	3	3	3
Qualitative Analysis (Chem. 5–c)			3
General Zoölogy (Zoöl. 30–a, 31–b, 32–c)	3	3	3
Trigonometry (Math. 21–b)		3	
Military Art (M. A. 1–a, 2–b, 3–c)	1½	1½	1½
Physical Education (P. E. 51–a, 52–b, 53–c)	½	½	½
	18	18	17

Sophomore Year

Farm Dairying (D. H. 1–b)		4	
Farm Poultry (P. H. 1–a, 2–b)	3	3	
Vegetable Gardening (Hort. 1–c)			3
Practical Pomology (Hort. 3–c)			3
Economic Entomology (Ento. 1–a)	4		
Principles of Forestry (For. 1–c)			4
Agricultural Engineering (Agron. 1–a)	4		
Agricultural Chemistry (Chem. 43–a, 44–b, 45–c)	2	3	3
Physics (Phys. 1–a, 2–b)	3	3	
Agricultural Drawing (Draw. 10–c)			2
Forging (Shop 4–b)		3	
Woodwork (Shop 19–c)			2
Military Art (M. A. 4–a, 5–b, 6–c)	1½	1½	1½
Physical Education (P. E. 54–a, 55–b, 56–c)	½	½	½
	18	18	19

ANIMAL HUSBANDRY AND DAIRY HUSBANDRY COURSE

Junior Year

Field Crops (Agron. 2–a, 3–b)	3	3	
Soils (Agron. 4–c)			4
Anatomy (A. H. 4–a) or Testing Dairy Products (D. H. 4–a)	4		
Infectious Diseases (A. H. 5–b) or Ice Cream and Cheesemaking (D. H. 6–b)		4	
Non-Infectious Diseases (A. H. 6–c) or Butter Making (D. H. 7–c)			4
Feeds and Feeding (A. H. 3–c)			4
Market Milk (D. H. 5–b)		4	
Bacteriology (Bot. 9–a, 10–b, 11–c)	3	3	3
Elementary Geology (Geol. 1–a)	3		
Elective	5	4	3
	18	18	18

SENIOR YEAR

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Farm Management (Agron. 8–a)	4		
Soil Fertility (Agron. 5–b)		3	
Fertilizers (Agron. 6–c)			3
Animal Breeding (A. H. 7–a)	4		
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Rural Economics (Econ. 8–b)		3	
Meteorology (Met. 1–b)		3	
Elective	7	6	15
	18	18	18

FORESTRY COURSE

JUNIOR YEAR

Soils (Agron. 4–c)			4
Landscape Gardening (Hort. 7–c)			4
Plant Histology (Bot. 6–a, 7–b)	2	2	
Bacteriology (Bot. 8–a)	3		
Plant Physiology (Bot. 4–b, 5–c)		3	3
Dendrology (For. 2–a)	4		
Silviculture (For. 3–a, 4–b, 5–c)	3	3	3
Forest Mensuration (For. 6–b)		4	
Forest Utilization (For. 13–b)		3	
Elementary Geology (Geol. 1–a)	3		
Elective	3	3	4
	18	18	18

SENIOR YEAR

Plant Pathology (Bot. 12–a, 13–b)	3	2	
Forest Protection (For. 9–a)	3		
Forest Management (For. 7–b. 8–c)		3	3
Forest Practice (For. 14–c)			4
Meteorology (Met. 1–b)		3	
Surveying (Math. 22–a)	3		
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Rural Economics (Econ. 8–b)		3	
Forest Insects (Ento. 8–c)			3
Elective	6	4	8
	18	18	18

HORTICULTURAL COURSE

JUNIOR YEAR

Greenhouse Management (Hort. 2–a)	3		
Small Fruits (Hort. 4–b)		3	
Landscape Gardening (Hort. 7–c)			4
Nursery Management (Hort. 8–c)			3
Vegetable Forcing (Hort. 11–b)		3	
Bacteriology (Bot. 8–a)	3		
Plant Physiology (Bot. 4–b, 5–c)		3	3
Field Crops (Agron. 2–a, 3–b)	3	3	
Soils (Agron. 4–c)			4
Elementary Geology (Geol. 1–a)	3		
Orchard and Garden Insects (Ento. 2–a)	3		
Elective	3	6	4
	18	18	18

FOUR-YEAR COURSES

Senior Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Systematic Pomology (Hort. 5–a, 6–b)	3	3	
Evol. and Improv. of Plants (Hort. 10–c)			3
Horticultural Seminar (Hort. 12–c)			1
Plant Pathology (Bot. 12–a, 13–b)	3	2	
Farm Management (Agron. 8–a)	4		
Soil Fertility (Agron. 5–b)		3	
Fertilizers (Agron. 6–c)			3
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Rural Economics (Econ. 8–b)		3	
Surveying (Math. 22–a)	3		
Meteorology (Met. 1–b)		3	
Elective	2	2	10
	18	19	17

TEACHER TRAINING COURSE

Junior Year

Field Crops (Agron. 2–a, 3–b)	3	3	
Dairy Management (D. H. 13–a)	4		
Bacteriology (Bot. 8–a)	3		
General Psychology (Psy. 10–a)	3		
Insects of Orchard and Garden (Ento. 2–a)	3		
Care and Treatment of Animals (A. H. 13–b)		4	
Poultry for Teachers (P. H. 11–b)		2	
Secondary Education (Ed. 10–b)		2	
Secondary Education (Ed. 12–b)		3	
Small Fruits (Hort. 4–b)		3	
Soils (Agron. 4–c)			4
Farm Accounting (Agron. 7–c)			3
Feeds and Feeding (A. H. 3–c)			4
Poultry Brooding (P. H. 12–c)			1
Rural Community Sociology (Soc. 5–c)			3
Evol. and Improv. of Plants (Hort. 10–c)			3
Elective	3	2	
	19	19	18

Senior Year

Farm Management (Agron. 8–a)	4		
Breed. and Manage. of Livestock (A. H. 14–a)	3		
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Plant Pathology (Bot. 12–a, 13–b)	3	2	
Vocational Education (Ed. 20–a)	3		
Agriculture in the High School (Ed. 35–b)		3	
Soil Fertility (Agron. 5–b)		3	
Rural Economics (Econ. 8–b)		3	
Adolescent Psychology (Psy. 24–b)		3	
Fertilizers (Agron. 13–c)			2
School Hygiene (Ed. 27–c)			2
Supervised Practice Teaching in Agri. (Ed. 36–c)			11
Elective	2	2	
	18	19	15

ARTS AND SCIENCE DIVISION

ERNEST R. GROVES, *Dean*

In the Arts and Science Division the following courses are offered:

General Arts and Science Course.—This course provides a general college training which especially prepares for secondary school teaching, business or graduate study. By means of the group system of elective studies an opportunity is given the student to specialize in zoölogy, botany, chemistry, physics, drawing, agriculture, mathematics, modern languages, English, psychology, sociology, political science, economics, history, home economics, and education.

Home Economics Course.—The course in home economics furnishes instruction in the branches that especially serve the need of women students. The work is planned to meet the demands of the day for scientific training in home making, to fit students to enter fields of professional activity in educational and institutional lines of work, and to provide thorough training for those students who wish to elect home economics as either a major or a minor subject in the Arts and Science Course.

The technical work in household science is based upon the principles of physical, biological and social sciences. The subjects in foods, nutrition and dietetics require physics, chemistry and physiology; those in sanitation necessitate a knowledge of chemistry and bacteriology; home administration and the care and education of children demands a knowledge of the principles of human nutrition and dietetics, and of the principles of economics, psychology and sociology. The training in drawing, color, and design which is gained in the department of drawing is related to the work in costume design and house decoration.

Four types of home economics courses are offered:

(1) Teacher Training Course. This is to train students for meeting state requirements for teaching in the Smith-Hughes high schools.

(2) Institutional Course. This is to train students for positions as managers and assistants in public institutions, such as college dormitories, hospitals, tea rooms, cafeterias, etc.

(3) Dietitians Course. This course is to train students for the dietary work in hospitals or in the feeding of other institutional groups.

(4) A General Course. For those not majoring in Home Economics

there are several elections offered in addition to subjects in the other three courses which may be elected.

The Arts Course in Chemistry.—This is a general course in chemistry, less technical in character than the chemical engineering course. It prepares for certain kinds of commercial chemistry, secondary science teaching, and affords a splendid basis for graduate work in medical schools. The considerable amount of electives permits the student to choose work in education if professional preparation for teaching is desired.

ARTS AND SCIENCE DIVISION

GENERAL ARTS AND SCIENCE COURSE

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Freshman Year			
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
***Military Art** (M. A. 1–a, 2–b, 3–c)	1½	1½	1½
***Physical Education** (50–a, 51–b, 52–c)	½	½	½
Electives	12	12	12
	17	17	17
Sophomore Year			
†**Military Art** (M. A. 5–a, 6–b, 7–c)	1½	1½	1½
†**Physical Education** (53–a, 54–b, 55–c)	½	½	½
Electives	15	15	15
	17	17	17
Junior Year			
Electives	17	17	17
Senior Year			
Electives	17	17	17

* Physical Education 1–a, 2–b and 3–c, giving 1 credit, are required of women students instead of Military Art and Physical Education 50–a, 51–b and 52–c.

† Physical Education 4–a, 5–b and 6–c, giving 1 credit, are required of women students instead of Military Art and Physical Education 53–a, 54–b, 55–c.

HOME ECONOMICS

Dietitian's Course

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
Inorganic Chemistry (Chem. 6–a, 7–b, 8–c)	3	3	3
*Physics (Phys. 1–a, 2–b, 3–c)	3	3	3
Drawing (Draw. 23–a, 24–b, 25–c)	2	2	2
†French or German	3	3	3
Personal Hygiene (Phys. Ed. 13–a, 14–b)	1	1	
Physical Education (Phys. Ed. 1–a, 2–b, 3–c)	1	1	1
Electives	2	2	3
	18	18	18

Sophomore Year

Textiles (H. E. 3–c)			3
Foods and Principles of Cooking (H. E. 4–a, 5–b, 6–c)	3	3	3
Physiology (Zoöl. 33–a, 34–b, 35–c)	3	3	3
Organic Chemistry (Chem. 15–a, 16–b)	2	2	
Drawing (Draw. 20–a, 21–b, 22–c)	2	2	2
†French or German	3	3	3
Physical Education (Phys. Ed. 4–a, 5–b, 6–c)	1	1	1
Electives	4	4	3
	18	18	18

Junior Year

Bacteriology (Bot. 8–a)	3		
Household Chemistry (Chem. 23–a)	3		
Household Physics (Phys. 12–a)	3		
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Physiological Chemistry (H. E. 14–b)		3	
Nutrition and Dietetics (H. E. 15–b, 16–c)		3	3
Advanced Cooking (H. E. 13–a, 13.5–b)	2	2	
House Management (H. E. 20–c)			3
House Decoration (H. E. 19–c)			2
Physical Education (Phys. Ed. 7–a, 8–b, 9–c)	1	1	1
Electives	3	6	9
	18	18	18

Senior Year

Institutional Management (H. E. 24–a, 25–b)	4	4	
Institutional Practice (H. E. 26–c)			12
Electives	11	11	
	15	15	12

* Not required of those students who offer Physics for entrance credit. Equivalent hours must be offered.

† Two years of either French or German. One year of each cannot be substituted.

FOUR-YEAR COURSES

Institutional Course

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
Inorganic Chemistry (Chem. 6–a, 7–b, 8–c)	3	3	3
***Physics** (Phys. 1–a, 2–b, 3–c)	3	3	3
Drawing (Draw. 23–a, 24–b, 25–c)	2	2	2
Personal Hygiene (Phys. Ed. 13–a, 14–b)	1	1	
Physical Education (Phys. Ed. 1–a, 2–b, 3–c)	1	1	1
Electives	5	5	6
	18	18	18

Sophomore Year

Textiles (H. E. 3–c)			3
Foods and Principles of Cooking (H. E. 4–a, 5–b, 6–c)	3	3	3
Physiology (Zoöl. 33–a, 34–b, 35–c)	3	3	3
Organic Chemistry (Chem. 15–a, 16–b)	2	2	
Drawing (Draw. 20–a, 21–b, 22–c)	2	2	2
English	2 or 3	2 or 3	2 or 3
Physical Education (Phys. Ed. 4–a, 5–b, 6–c)	1	1	1
Electives	4 or 5	4 or 5	3 or 4
	18	18	18

Junior Year

Bacteriology (Bot. 8–a)	3		
Household Chemistry (Chem. 23–a)	3		
Household Physics (Phys. 12–a)	3		
Elementary Economics (Econ. 1–a, 2–b)	3	3	
Nutrition and Dietetics (H. E. 15–b, 16–c)		3	3
Advanced Cooking (H. E. 13–a, 13.5–b)	2	2	
House Management (H. E. 20–c)			3
House Decoration (H. E. 19–c)			2
Physical Education (Phys. Ed. 7–a, 8–b, 9–c)	1	1	1
Electives	3	9	9
	18	18	18

Senior Year

Institutional Management (H. E. 24–a, 25–b)	4	4	
Institutional Practice (H. E. 26–c)			12
Electives	11	11	
	15	15	12

* Not required of those students who offer Physics for entrance credit. Equivalent hours must be offered.

Teacher Training Course

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
Drawing (Draw. 23–a, 24–b, 25–c)	2	2	2
Inorganic Chemistry (Chem. 6–a, 7–b, 8–c)	3	3	3
*Physics (Phys. 1–a, 2–b, 3–c)	3	3	3
Elementary Clothing (H. E. 1–a, 2–b, 2.5–c)	2	2	2
Personal Hygiene (Phys. Ed. 13–a, 14–b)	1	1	
Physical Education (Phys. Ed. 1–a, 2–b, 3–c)	1	1	1
Electives	3	3	4
	18	18	18

Sophomore Year

Textiles (H. E. 3–c)			3
Foods and Principles of Cooking (H. E. 4–a, 5–b, 6–c)	3	3	3
Elementary Dressmaking (H. E. 29–a, 17–b)	2	2	
Physiology (Zoöl. 33–a, 34–b, 35–c)	3	3	3
Drawing (Draw. 20–a, 21–b, 22–c)	2	2	2
Organic Chemistry (Chem. 15–a, 16–b)	2	2	
Household Physics (Phys. 12–a)	3		
Physical Education (Phys. Ed. 4–a, 5–b, 6–c)	1	1	1
Electives	2	5	6
	18	18	18

Junior Year

Millinery (H. E. 12–b)		2	
Bacteriology (Bot. 8–a)	3		
Household Chemistry (Chem. 23–a)	3		
Elementary Economics (Econ. 1–a, 2–b)	3	3	
General Psychology (Psych. 10–a)	3		
Secondary Education (Ed. 10–b, 11–c)		2	3
Advanced Cooking (H. E. 13–a, 13.5–b)	2	2	
Nutrition and Dietetics (H. E. 15–b, 16–c)		3	3
House Decoration (H. E. 19–c)			2
House Management (H. E. 20–c)			3
Physical Education (Phys. Ed. 7–a, 8–b, 9–c)	1	1	1
Electives	2	4	5
	17	17	17

Senior Year

Home Nursing (H. E. 21–a)	2		
Home Econ. in High School (Ed. 30–a, 31–b)	3	3	
†Practice Teaching (Ed. 32–c)			11
Vocational Education (Ed. 20–a)	3		
School Hygiene (Ed. 28–c)			2
Sociology (Soc. 3–a, 4–b)	3	3	
Adolescent Psychology (Psych. 24–b)		3	
‡Practice House (H. E. 22–b)		3	
Electives	6	3	
	17	15	13

* Not required of those who offer Physics for entrance credit. Equivalent hours must be offered.

† While practice teaching no other subject should be scheduled except Ed. 32–c.

‡ Practice House (H. E. 22–b) is required during the Winter Term. During the term this subject is taken, the student will be allowed to carry not more than 15 credit hours, and the student should schedule no eight o'clock classes.

*ARTS COURSE IN CHEMISTRY

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Inorganic Chemistry (Chem. 1–a, 2–b, 3–c)	3	3	3
Qualitative Analysis (Chem. 4–c)			3
Trigonometry (Math. 1–a)	3		
Algebra (Math. 2–a, 3–b)	3	3	
Analytic Geometry (Math. 4–b, 5–c)		3	3
Calculus (Math. 6–c)			3
Zoölogy (Zoöl. 1–a, 2–b) or **Botany** (Bot. 1–a, 2–b)	3	3	
English (Eng. 1–a, 2–b, 3–c)	3	3	3
†**Military Art** (M. A. 1–a, 2–b, 3–c)	1½	1½	1½
†**Physical Education** (P. E. 50–a, 51–b, 52–c)	½	½	½
	17	17	17

Sophomore Year

Organic Chemistry (Chem. 20–a, 21–b, 22–c)	2	3	3
Inorganic Prep. (Chem. 17–a)	2		
Qualitative Chemistry (Chem. 9–a)	3		
Quantitative Analysis (Chem. 18–b, 19–c)		5	7
German (Ger. 1–a, 2–b, 3–c) or **French** (Fr. 1–a, 2–b, 3–c)	3	3	3
Calculus (Math. 7–a)	3		
Machine Work (Shop 22–c)			3
Drawing (Draw. 5–a)	2		
†**Military Art** (M. A. 4–a, 5–b, 6–c)	1½	1½	1½
†**Physical Education** (P. E. 53–a, 54–b, 55–c)	½	½	½
Calculus (Math. 8–b) or **Electives**		3	
Elective		3	
	17	19	18

Junior Year

Physical Chemistry (Chem. 29–a, 30–b, 31–c)	3	3	3
Quantitative Analysis (Chem. 26–a, 27–b, 28–c)	4	4	4
Organic Laboratory (Chem. 25–b, 24–c)		2	2
Physics (Phys. 6–a, 7–b, 8–c)	3	3	3
Physics (Phys. 9–a, 10–b, 11–c)	3	3	3
Elective	3	3	3
	16	18	18

Senior Year

Physical Laboratory (Chem. 42–a)	2		
Advanced Inorganic Chemistry (Chem. 32–a, 33–b, 34–c)	3	3	3
Thesis (Chem. 39–a, 40–b, 41–c)	5	5	5
Elective (three may be added to thesis each term)	6	9	9
	16	17	17

* Students planning to teach Chemistry are advised to elect subjects in Education.

† Physical Education for Women giving 1 credit, is required of women students instead of Military Art and Physical Education for men as listed.

ENGINEERING DIVISION

CALVIN H. CROUCH, *Acting Dean*

The Engineering Division offers the following four-year courses:

Chemical Engineering Course.—This course is intended to fit the student for the career of a professional chemist or chemical engineer, and to give a good foundation for original and independent chemical research.

Instruction is imparted by lectures, recitations and a large amount of carefully supervised laboratory work. The laboratory study is largely an individual one, and the work of each student is conducted with reference not only to the particular object he may have in view, but also to the acquirement of a broad knowledge of chemical science. The student is given a thorough training in German and French to enable him to read with ease the chemical literature; a thorough grounding in mathematics, necessary for advanced theoretical chemistry or chemical engineering; a somewhat limited amount of special work in both mechanical and electrical engineering and a thorough undergraduate training in theoretical and applied chemistry. He is encouraged to develop the power of solving chemical problems by independent thought through the aid of the reference library and chemical periodicals.

Electrical Engineering Course.—The electrical engineering course is intended to meet the demands of young men fitting themselves for professional engineering in connection with the various applications of electricity.

By means of lectures, recitations and laboratory work, the subjects of the course are brought to the attention of the student in such a manner as not only to emphasize the present needs of the practitioner and engineer, but to give him the principles that will enable him to grasp and understand the constantly increasing number of new problems that require solution.

The instruction aims to impart a thorough knowledge of the best modern types of electrical machines and appliances, and the methods of designing, building and operating them.

The rapid progress in recent years in the application of electricity to commercial uses renders it difficult, if not impossible, for one without a technical education to gain prominence in the work and assume the more responsible positions.

Mechanical Engineering Course.—The mechanical engineering course is intended to train young men for positions of responsibility in the field of the mechanical industries. The studies in the course are scientific, including mathematics, physics and chemistry; technical, including drawing, shop work, thermodynamics, hydraulics, machine design, electrical engineering, power engineering; and cultural, designed to fit him socially for his proper place in the world.

Instruction is given by means of recitations, lectures and laboratory work supplemented by illustrated lectures and assigned reading. Throughout the course the theoretical work is supplemented by actual practice in mechanical operation and scientific research, by training in the use of tools for working wood and metals, and by experimental tests and demonstrations in the mechanical, electrical, chemical and physical laboratories.

ARCHITECTURAL CONSTRUCTION COURSE, INDUSTRIAL COURSE (CONSTRUCTION)

The Engineering Division also offers a four-year Architectural Construction Course and an Industrial Course which are particularly designed to prepare for positions as salesmen, foremen, superintendents and managers in the fields of electrical, mechanical and architectural manufacturing and construction, and for the training of teachers of Mechanic Arts and related subjects in the secondary schools. The teacher training course is specially designed to prepare for Smith-Hughes teaching positions.

The subjects offered in these courses have been so chosen as to involve less mathematics, physics and mechanics and more shop work, laboratory work, drawing, economics, English, etc. than is required in the regular four-year Engineering courses. The basic work of the several branches of the Industrial Course is identical throughout the four years. Specialization is made possible in the Junior and Senior years and is provided for largely through selected groups of elective subjects.

All of the subjects with numbers less than 100 are regular four-year subjects given in the engineering courses, a description of which will be found in the catalog under the particular department in which the subject is given. All numbers from 100 to 200 are subjects adapted to meet the requirements of the Architectural Construction Course and the Industrial Course. Description of the subjects will also be found under the departments in which the subjects are given.

ENGINEERING DIVISION

ELECTRICAL AND MECHANICAL ENGINEERING COURSES

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1-a, 2-b, 3-c)	3	3	3
Inorganic Chemistry (Chem. 1-a, 2-b, 3-c)	3	3	3
Trigonometry (Math. 1-a)	3		
Algebra (Math. 2-a, 3-b)	3	3	
Analytical Geometry (Math. 4-b, 5-c)		3	3
Calculus (Math. 6-c.)			3
Engineering Drawing (Draw. 1-a, 1.5-b)	2	2	
Machine Drawing (Draw. 2-c.)			2
Woodwork (Shop 1-a)	2		
Forge Shop (Shop 5-c)			2
Military Art (M. A. 1-a, 2-b, 3-c)	1½	1½	1½
Physical Education (P. E. 50-a, 51-b, 52-c)	½	½	½
Elective		2	
	18	18	18

Sophomore Year

Qualitative Analysis Laboratory (Chem. 11-a, 12-b)	3	3	
Calculus (Math. 7-a, 8-b, 9-c)	3	3	3
Physics (Phys. 6-a, 7-b, 8-c)	3	3	3
Physics Laboratory (Phys. 9-a, 10-b, 11-c)	3	3	3
Mechanics of Engineering (M. E. 2-c)			3
Machine Drawing (Draw. 3-a)	2		
Descriptive Geometry (Draw. 4-b, 4.5-c)		2	2
Machine Work (Shop 6-a, 7-b, 8-c)	2	2	2
Military Art (M. A. 4-a, 5-b, 6-c)	1½	1½	1½
Physical Education (P. E. 53-a, 54-b, 55-c)	½	½	½
	18	18	18

Electrical Engineering

Junior Year

Dynamo Electric Machinery (E. E. 1-a, 2-b, 3-c)	4	4	4
Mechanics of Engineering (M. E. 3-a, 4-b, 4.5-c)	3	3	3
Mechanical Laboratory (M. E. 5-a, 6-b, 7-c)	2	2	2
Materials of Construction (M. E. 8-a)	3		
Machine Design (M. E. 9-a)	3		
Machine Design (M. E. 10-b), or Coast Artillery (M. A. 8-b)		3	
Valve Gears and Boiler Design (M. E. 11-c)			3
Thermodynamics (M. E. 14-b, 15-c)		3	3
Kinematics (M. E. 1-b)		3	
Elective	3		3
	18	18	18

Senior Year

Electrical Laboratory (E. E. 11-a, 12-b, 13-c)	3	3	3
Electrical Engineering Practice (E. E. 7-a, 8-b)	3	3	
Electric Railways (E. E. 10-b)		3	
Power Plant Engineering (M. E. 16-a, 17-b)	3	3	
Transmission and Distribution (E. E. 9-c)			3
Mechanical Laboratory (M. E. 18–a)	2		
Design of Electrical Machinery (E. E. 18-c)			3
Surveying (Math. 19-a, 20-c)	3		3
Hydraulics (M. E. 12-b, 13-c)		3	3
Electives	4	3	3
	18	18	18

FOUR-YEAR COURSES

Mechanical Engineering

Junior Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
Industrial Electricity (E. E. 15-a, 16-b, 17-c)	3	3	3
Mechanics of Engineering (M. E. 3-a, 4-b, 4.5-c)	3	3	3
Mechanical Laboratory (M. E. 5-a, 6-b, 7-c)	2	2	2
Materials of Construction (M. E. 8-a)	3		
Machine Design (M. E. 9-a)	3		
Machine Design (M. E. 10-b), or Coast Artillery (M. A. 8-b)		3	
Valve Gears and Boiler Design (M. E. 11-c)			3
Thermodynamics (M. E. 14-b, 15-c)		3	3
Kinematics (M. E. 1–b)		3	
Electives	4	1	4
	18	18	18

Senior Year

Electrical Laboratory 1920–21 only (E. E. 22-a)	2		
Power Plant Engineering (M. E. 16-a, 17-b)	3	3	
Heating and Ventilating (M. E. 21-b)		3	
Mechanical Laboratory (M. E. 18-a, 19-b, 20-c)	2	2	2
Machine Design (M. E. 23-b, 24-c)		3	3
Hydraulics (M. E. 12-b, 13-c)		3	3
Surveying (Math. 19-a, 20-c)	3		3
Electives	8	4	7
	18	18	18

Approved Electives for Electrical and Mechanical Engineers

Electrical Engineering:			
Illuminating Engineering (E. E. 19-b)		2	
Water Supply and Water Purification (M. E. 28-a)	2		
Electrical Problems (E. E. 21-c)			2
Telegraph and Telephone Engineering (E. E. 4-a)	2		
Coast Artillery (M. A. 7-a, 8-b, 9-c)	3	3	3
Coast Artillery (M. A. 10-a, 11-b, 12-c)	3	3	3
Mechanical Engineering:			
Industrial Engineering (M. E. 25-a)	2		
Water Supply and Water Purification (M. E. 28-a)	2		
Thesis (M. E. 30-c)			3–6
Coast Artillery (M. A. 7-a, 8-b, 9-c)	3	3	3
Coast Artillery (M. A. 10-a, 11-b, 12-c)	3	3	3

CHEMICAL ENGINEERING COURSE

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1–a, 2–b, 3–c)	3	3	3
French (Fr. 1–a, 2–b, 3–c) or German (Ger. 1–a, 2–b, 3–c)	3	3	3
Inorganic Chemistry (Chem. 1–a, 2–b, 3–c)	3	3	3
Trigonometry (Math. 1–a)	3		
Algebra (Math. 2–a, 3–b)	3	3	
Analytic Geometry (Math. 4–b, 5–c)		3	3
Calculus (Math. 6–c)			3
Drawing (Draw. 5–a)	2		
Military Art (M. A. 1–a, 2–b, 3–c)	1½	1½	1½
Physical Education (P. E. 50-a, 51-b, 52-c)	½	½	½
	19	17	17

Sophomore Year

German (Ger. 4–a, 5–b, 6–c)	3	3	3
Organic Chemistry (Chem. 20–a, 21–b, 22–c)	2	3	3
Qualitative Analysis (Chem. 10–a)	6		
Quantitative Analysis (Chem. 18–b, 19–c)		5	7
Calculus (Math. 7–a, 8–b, 9–c)	3	3	3
Mineralogy (Miner. 1–b)		3	
Military Art (M. A. 4–a, 5–b, 6–c)	1½	1½	1½
Physical Education (P. E. 53-a, 54-b, 55c)	½	½	½
	16	19	18

Junior Year

Physical Chemistry (Chem. 29–a, 30–b, 31–c)	3	3	3
Organic Chemical Laboratory (Chem. 24–a, 25–b)	2	2	
Quantitative Analysis (Chem. 26–a, 27–b, 28–c)	4	5	4
Physics (Phys. 6–a, 7–b, 8–c)	3	3	3
Physics (Phys. 9–a, 10–b, 11–c)	3	3	3
Machine Work (Shop 22–c)			3
Electives	3	3	3
	18	19	19

Senior Year

Industrial Chemistry (Chem. 35–a, 36–b, 37–c)	3	3	3
Physical Chemistry Laboratory (Chem. 42–a)	2		
Quantitative Analysis (Chem. 38–a) or Thesis (Chem. 39–a)	4		
Thesis (Chem. 40–b, 41–c)		6	6
Electrical Engineering (E. E. 15–a, 16–b, 17–c)	3	3	3
Materials of Construction (M. E. 8–a)	3		
Thermodynamics (M. E. 14–b, 15–c)		3	3
Electives	3	3	3
	18	18	18

ARCHITECTURAL CONSTRUCTION COURSE

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English Composition (Eng. 1-a, 2-b, 3-c)	3	3	3
Inorganic Chemistry (Chem. 1-a, 2-b, 3-c)	3	3	3
Trigonometry (Math. 21-c)			3
Algebra (Math. 101-a)	3		
Solid Geometry (Math. 103-b)		3	
Freehand Drawing (Draw. 30-a, 31-b, 32-c)	3	3	3
Engineering Drawing (Draw. 1-a, 1.5-b)	2	2	
Machine Drawing (Draw. 2-c)			2
Woodwork (Shop 1-a, 2-b, 3-c)	2	2	2
Military Art (M. A. 1-a, 2-b, 3-c)	1½	1½	1½
Physical Education (P. E. 50-a, 51-b, 52-c)	½	½	½
	18	18	18

Sophomore Year

Shop Mathematics (Math. 102-a)	3		
Physics (Phys. 1-a, 2-b, 3-c)	3	3	3
Machine Drawing (Draw. 3-a)	2		
Descriptive Geometry (Draw. 4-b, 4.5-c)		2	2
Elements of Architecture (Draw. 103-b, 103.5-c)		2	2
Dendrology (For. 2-a)	4		
Woodwork (Shop 101-a, 102-b, 103-c)	2	2	2
Forge (Shop 104-a)	2		
Elements of Mechanics (M. E. 101-b, 102-c)		3	3
Military Art (M. A. 4-a, 5-b, 6-c)	1½	1½	1½
Physical Education (P. E. 53-a, 54-b, 55-c)	½	½	½
Electives		4	4
	18	18	18

Junior Year

Domestic Architecture (Draw. 104-a, 105-b, 106-c)	3	4	3
Building Construction (Draw. 107-b, 108-c)		4	4
Materials of Construction (M. E. 8-a)	3		
Elements of Mechanics (M. E. 103-a)	3		
Mechanical Laboratory (M. E. 107-a, 108-b, 109-c)	2	2	2
Clay Products and Building Stones (Geol. 100-b)		2	
Electives	7	6	9
	18	18	18

Senior Year

Building Construction and Design (Draw. 109-a, 110-b)	8	8	
Architectural Thesis (Draw. 111-c)			10
Heating and Ventilating (M. E. 21-b)		3	
Elements of Electricity (E. E. 100-a)	3		
Electives	7	7	8
	18	18	18

Approved Electives for Architectural Course

Surveying (Math. 22-a, 23-c)	3		3
Industrial Engineering (M. E. 25-a)	3		
Accounting (Econ. 12-a, 13-b, 14-c)	3	3	3
Water Supplies and Water Purification (M. E. 28-a)	2		
Public Speaking (Eng. 7-c) or Writing for Publication (Eng. 6-a)	3		3
Coast Artillery (M. A. 7-a, 8-b, 9-c)	3	3	3
Coast Artillery (M. A. 10-a, 11-b, 12-c)	3	3	3

INDUSTRIAL COURSE

Freshman Year

	Fall Term ("A")	Winter Term ("B")	Spring Term ("C")
English (Eng. 1-a, 2-b, 3-c)	3	3	3
Inorganic Chemistry (Chem. 1-a, 2-b, 3-c)	3	3	3
Algebra (Math. 101-a)	3		
Trigonometry (Math. 21-c)			3
Solid Geometry (Math. 103-b)		3	
Shop Mathematics (Math. 102-a, 104-b, 106-c)	3	3	3
Engineering Drawing (Draw. 1-a, 1.5-b)	2	2	
Machine Drawing (Draw. 2-c)			2
Wood Working (Shop 1-a, 2-b, 3-c)	2	2	2
Military Art (M. A. 1-a, 2-b, 3-c)	1½	1½	1½
Physical Education (P. E. 50-a, 51-b, 52-c)	½	½	½
	18	18	18

Sophomore Year

Advanced Composition (Eng. 4-a,)	3		
Public Speaking (Eng. 7-c)			3
Qualitative Analysis Laboratory (Chem. 11-a, 12-b)	3	3	
Physics (Phys. 1-a, 2-b, 3-c)	3	3	3
Elements of Mechanics (M. E. 101-b, 102-c)		3	3
Machine Drawing (Draw. 3-a)	2		
Descriptive Geometry (Draw. 4-b, 4.5-c)		2	2
Forge (Shop 104-a)	2		
Machine Shop (Shop 105-b, 106-c)		2	2
Military Art (M. A. 4-a, 5-b, 6-c)	1½	1½	1½
Physical Education (P. E. 53-a, 54-b, 55-c)	½	½	½
Elective	3	3	3
	18	18	18

Junior Year

Power Plant Machinery (M. E. 105-b, 106-c)		3	3
Elements of Electricity (E. E. 100-a, 101-b, 102-c)	3	3	3
Elements of Mechanics (M. E. 103-a)	3		
Mechanical Laboratory (M. E. 107-a, 108-b, 109-c)	2	2	2
Materials of Construction (M. E. 8-a)	3		
Machine Design (M. E. 110-a)	2		
Electives from group 1, 2 or 3	5	10	10
	18	18	18

Senior Year

Electrical Machinery (E. E. 103-a, 104-b)	3	2	
Electrical Laboratory (E. E. 105-a, 106-b, 107-c)	2	2	*2
Mechanical Laboratory (M. E. 114-a, 115-b, 116-c)	2	2	*2
Machine Shop (Shop 107-a, 108-b, 109-c)	2	2	*2
Electives from group 1, 2 or 3	9–10	10–11	*12
	18–19	18–19	18

Students intending to specialize in manufacturing, industrial management or construction will take their electives from Group 1 subject to the approval of the Dean of Engineering.

Students planning to specialize in salesmanship will take their electives from Group 2 listed below, with emphasis being placed upon the

* Not required of students preparing to become teachers. Such students will take an equivalent number of hours from Group 3 listed below.

subjects in Economics, English and Foreign Languages subject to the approval of the Dean of Engineering.

Students preparing to engage in teaching Mechanic Arts under the Smith-Hughes provisions will take their electives during their Junior and Senior years from Group 3 listed below, and must take the work in Education and Psychology as prescribed. In the Senior year they will also take nine hours of prescribed electives from this group during the fall term and ten hours during the winter term.

PRESCRIBED ELECTIVES, GROUPS I, II, III

* Required to be taken in the Junior year.
** Required to be taken in the Senior year.

Group I

Manufacturing, Industrial Management or Construction

* Power Plant Machinery
* Shop Work (Forge or machine)
** Shop Work (Machine shop)
Economics
English
Sociology
Military Art
Engineering subjects

Group II

Salesmanship

English
* Economics
* Foreign Languages—French or Spanish
Sociology
Military Art
Engineering subjects

Group III

Teacher Training in Mechanic Arts (Smith-Hughes Course)

* Elements of Psychology (10-a)
* Secondary Education (10-b)
* Secondary Education (11-c)
** Vocational Education (20-a)
** Psychology (24-b)
** Education (40-b)
** Education (27-c)
** Education (41-c)
Chemistry
Economics
English
Engineering subjects
Mathematics
Physics
Sociology
Military Art

AGRICULTURAL DIVISION

FREDERICK W. TAYLOR, *Dean*

DEPARTMENTS

AGRONOMY
AGRICULTURAL CHEMISTRY
BOTANY
ENTOMOLOGY
HORTICULTURE
ANIMAL HUSBANDRY
DAIRY HUSBANDRY
FORESTRY
POULTRY HUSBANDRY

AGRICULTURE

FREDERICK W. TAYLOR, *Professor*
WALDO B. COOKINGHAM, *Assistant Professor*

1-b. Survey of Agriculture. A brief history of agriculture as a business and scientific profession in this country; a general discussion and survey of the various branches of agriculture and the opportunities for work which each affords. The subject is intended primarily to assist the student in selecting his technical subjects in the later years of his college course. Mr. Taylor.

Required of Freshmen in Agriculture. 1 credit: 1 lecture.

Educ. 35-b. Agriculture in the High School.

Required of Seniors taking the Teacher Training course. See Education 35-b.

3-b. Agricultural Seminar. Library and reference work, the preparation of bibliographies, a study of the work and history of agricultural colleges and experiment stations. Mr. Taylor.

Elective for Seniors in Agriculture. 1 credit: 1 lecture.

Educ. 36-c. Supervised Practice Teaching in Agriculture.

Required of Seniors taking the Teacher Training course. See Education 36-c.

AGRONOMY

FREDERICK W. TAYLOR, *Professor*
M. GALE EASTMAN, *Assistant Professor*

1–a. Agricultural Engineering. Lectures and recitations upon the mapping of farms; fencing; drainage; farm sanitation; tillage and harvesting machinery; concrete construction; silos; farm motors; roads and principles of draft. Practical work in map making, laying out drains, rope splicing, comparing farm machines, etc. Mr. Taylor.

Required of Sophomores in Agriculture. 4 credits: 3 lectures; 1 laboratory.

2–a. Forage Crops. Text book, lectures, and recitations covering the history, use, value, and methods of producing forage crops, including grasses, legumes, and roots. Practical work in judging and identifying in the field and in the laboratory. Mr. Eastman.

Required of Juniors in Agriculture, except in Forestry course. 3 credits: 2 lectures; 1 laboratory.

3–b. Cereal Crops. Text books, lectures, and recitations covering the history, use, value and methods of producing cereal crops. Laboratory work in identifying and judging grain plants and their products.

Practically all the common field crops including potatoes, tobacco, etc., will consider 2–a and 3–b. Plants will be studied with particular reference to New England conditions, but their distribution in the United States or elsewhere will also be noted as a measure of their general adaptability. Important crops not grown in our section, like cotton and rice will be briefly surveyed. Mr. Eastman.

Required of Juniors in Agriculture, except in Forestry course. 3 credits: 2 lectures; 1 laboratory.

4–c. Soils. Text book and recitations upon the formation, kinds and physical properties of soils; the movements and conservation of soil moisture; the relation of heat and air to soil; the nature and physical effects of tillage and fertilizers; laboratory work and experimentation with soils to show the physical effects of different conditions and texture. Mr. Eastman.

Required of Juniors in Agriculture. 4 credits: 3 lectures; 1 laboratory.

5-b. Soil Fertility. Lectures, text book and recitations upon the chemistry of soils and the principles of fertility. Mr. Taylor.

Prerequisite: Chemistry 44-b. Required of Seniors in Agriculture, except in Forestry course. 3 credits: 3 recitations.

6-c. Fertilizers. Lectures, text book and recitations upon the value, use and function of plant food materials, including manure, and upon the compounding and selection of fertilizers. Mr. Taylor.

Prerequisite: Agronomy 5-b. Required of Seniors in Agriculture, except in Forestry course. 3 credits: 3 recitations.

7-c. Farm Accounting. Lectures and reference work relating to the principles of accounting and their application to the farm business. Laboratory exercises will include sets of complete cost accounts taken from actual farms. Mr. Eastman.

Elective for Juniors. 3 credits: 1 lecture; 2 laboratories.

8-a. Farm Management. Text book, lectures and recitations upon the development of farming as a business, types of farming, size of farms, cropping systems, live stock problems, the marketing of farm products, and choosing and buying a farm. Practical work will be given in laying out farms, and in studying survey records of individual farms in order to find the labor income; also in analyzing the farm business record for the purpose of determining the effect of efficiency factors on the profits made. Exercises will be given in the arrangement and rearrangement of farm buildings, plotting the distribution of labor, and taking survey records. Mr. Eastman.

Required of Seniors in Agriculture, except in Forestry course. 4 credits: 2 lectures; 2 laboratories.

9-b. Agricultural Statistics. An advanced subject for those who wish to familiarize themselves with proper methods of obtaining and tabulating statistics and experimental data. Lectures and laboratory work will deal with some of the common sources of error likely to affect scientific findings as well as everyday conclusions. Mr. Eastman.

Elective for Seniors. 2 credits: 1 lecture; 1 laboratory.

10-c. Types of Farming. A statistical study of the types of farming in the United States, with special reference to crop rotation, area in

crops, use of machinery, efficiency of man and horse labor, adaptability of crops and animals, and relative profits. Mr. Eastman.

Prerequisite: Agronomy 8–a. Elective for Seniors. 2 credits: 1 lecture; 1 laboratory.

11–b, 12–c. **Special Agronomy.** Advanced work for students interested in some particular phase of Agronomy. No class exercises. The hours and kind of work must be arranged with the department before the subject is elected. Mr. Taylor.

Prerequisites: Agronomy 1–a to 5–b inclusive. Elective for Seniors. 1 to 3 credits.

13–c. **Fertilizers.** Similar to 6–c. For Senior Teacher Training students only. Mr. Taylor.

Prerequisite: Agronomy 5–b. 2 credits: 2 recitations.

ANIMAL HUSBANDRY

Otto L. Eckman, *Professor*
Clifford J. Fawcett, *Assistant Professor*

1–a. **Types and Breeds of Live Stock.** A study of the different breeds of horses, cattle, sheep, and swine in respect to their origin, history, development, characteristics, and adaptability to different conditions of climate and soil. One afternoon each week is devoted to judging the different breeds. Mr. Fawcett.

Required of Freshmen in Agriculture. 4 credits: 3 recitations; 1 laboratory.

2–c. **Live Stock Judging.** The work consists of a study of the principles and practice of judging horses, beef cattle, sheep, and swine, and of the market classes and grades of horses and meat animals. Students intending to compete for the live stock judging team should elect this subject. For laboratory work, trips are taken to some of the best breeding establishments in New England. Mr. Fawcett.

Prerequisite: Animal Husbandry 1–a. Elective for Juniors. 3 credits: 3 recitations.

3–c. **Feeds and Feeding.** An elementary study of the laws of nutrition, the character, composition, and digestibility of feed stuffs, and methods of feeding different kinds of farm animals. Numerous samples of grains and by-products are used for the purpose of familiarizing the

students with the different feed stuffs. Practice is given in calculating rations for various purposes. Mr. Eckman.

Prerequisite: Chemistry 3–c. Required of Juniors in Animal Husbandry, Dairy Husbandry and Teacher Training courses. 4 credits: 3 recitations; 1 laboratory.

4–a. Anatomy of Farm Animals. Lectures and recitations upon the form and structure of the domesticated animals. Skeletons, various anatomical specimens, models, charts, and lantern slides are used to make the subject as practical as possible. The purposes of this subject are to show the relation between the skeleton and the form and function of the animal, and to serve as a foundation for the intelligent study of animal diseases and ailments. Mr. Eckman.

Required of Juniors in Animal Husbandry. 4 credits: 3 recitations; 1 laboratory.

5–b. Infectious Diseases of Animals. A study of the more common economic infectious diseases of farm animals, their prevention and treatment, and general sanitation. Mr. Eckman.

Prerequisite: Animal Husbandry 4–a. Required of Juniors in Animal Husbandry. 4 credits: 3 recitations; 1 laboratory.

6–c. Non-Infectious Diseases and Ailments. A study of the common non-infectious diseases and ailments of farm animals and their treatment; unsoundness of the horse, principles of horseshoeing, and the practice of simple surgical operations. Mr. Eckman.

Prerequisite: Animal Husbandry 4–a. Required of Juniors in Animal Husbandry. 4 credits: 3 recitations; 1 laboratory.

7–a. Animal Breeding. A study of the principles and practices of breeding farm animals. Practice is given in tracing out and studying pedigrees. Mr. Eckman.

Prerequisite: Animal Husbandry 1–a. Required of Seniors in Animal Husbandry and Dairy Husbandry. 4 credits: 3 recitations; 1 laboratory.

8–c. Live Stock Markets and Products. A study of the various kinds of live stock markets and of the methods and regulations applying to the transportation of live stock. Some time will be spent in a study of the live stock centers, the stock yards, and the government inspection

of animals before and after slaughter. The butchering of animals on the farm and the various cuts of meats will be discussed. References will be supplied to the student for individual work. Occasional trips will be taken to slaughter houses and packing plants. Mr. Fawcett.

Prerequisite: Animal Husbandry 2–c. Elective for Seniors. 3 credits: 3 recitations.

9–a. Sheep and Swine Husbandry. A consideration of the judging, breeding, feeding, management and preparation for the show ring of sheep and swine, with special reference to New Hampshire conditions. Mr. Fawcett.

Prerequisites: Animal Husbandry 1–a and 3–c. Elective for Seniors. 4 credits: 3 recitations; 1 laboratory.

10–b. Management of Horses and Beef Cattle. Lectures and recitations upon the care of brood mares and cows, management of stallions and bulls, the breaking and training of colts, preparation of animals for the show ring, the management of pure bred beef herds, and the feeding and handling of steers and oxen. Mr. Eckman.

Prerequisites: Animal Husbandry 1–a and 3–c. Elective for Seniors. 4 credits: 3 recitations; 1 laboratory.

12–c. Animal Husbandry Seminar. Library and reference work and the preparation of papers on various Animal Husbandry subjects of timely importance. Mr. Eckman.

Prerequisites: Animal Husbandry 3–c, 5–b, 6–c, and 7–a. 2 credits: 1 seminar; 1 laboratory.

13-b. Care and Treatment of Farm Animals. This subject will include a certain amount of anatomy which will serve as a foundation for the study of the more important diseases and ailments. The object is to acquaint the student with the symptoms of the various diseases, their prevention and treatment. The principles of horse shoeing, simple surgical operations and farm butchering will be taught. Practice in the treatment of diseases, in castration, in dehorning and in the examination of horses for soundness will be given in so far as this is possible. Mr. Eckman.

Prerequisite: Animal Husbandry 1–a. Offered and designed for students in the Teacher Training course only. Junior Year. 4 credits: 3 recitations; 1 laboratory.

14–a. Breeding and Management of Livestock. In this subject will be given a brief consideration of the principles of breeding and their application to beef cattle, horses, sheep and swine. Practice in management will be given in so far as this is possible, including feeding and management of breeding animals, sheep shearing, training of colts and preparing animals for the show ring. Mr. Fawcett.

Prerequisites: Animal Husbandry 1–a and 3–c. Offered and designed for students in the Teacher Training course only. Senior Year. 3 credits: 2 recitations; 1 laboratory.

BOTANY

ORMOND R. BUTLER, *Professor*
FREDERICK C. WERKENTHIN, *Associate Professor*
W. L. DORAN, *Assistant Professor*

1–a. Elementary Botany. The course in elementary botany is devoted to a study of the seed plants, their morphology, physiology and classification. During the first term seeds, seed germination, seedlings and the form structure and function of roots, stems and leaves are studied. Mr. Werkenthin.

Required of Freshmen in Agriculture. 3 credits: 1 lecture; 2 laboratories.

2–b. Elementary Botany. Continuation of 1–a. During the second term a study of the kinds, form and function of buds, vegetative and sexual reproduction, fertilization and growth of the embryo, fruit and fruit dispersal is undertaken. Mr. Werkenthin.

Prerequisite: Botany 1–a. Required of Freshmen in Agriculture. 3 credits: 1 lecture; 2 laboratories.

3–c. Elementary Botany. Continuation of 2–b. The third term is devoted to a study of the effect of the environment on growth, types of vegetation, classification of plants, with especial attention to genera of economic importance, theories on the origin of species, the origin of our cultivated plants.

Prerequisite: Botany 2–b. Required of Freshmen in Agriculture. 3 credits: 1 lecture; 2 laboratories.

4–b, 5–c. Plant Physiology. Structure and properties of the cell; absorption and movement of water; metabolism; growth and irritability. Mr. Doran.

Prerequisite: Botany 3–c. Required of Juniors in Forestry and Horticulture. 3 credits: 1 lecture; 2 laboratories.

6–a, 7–b. Plant Histology. Characterization and differentiation of plant tissues; micro-technique. Mr. Doran.

Prerequisite: Botany 3–c. Required of Juniors in Forestry. 2 credits: 2 laboratories.

8–a. General Bacteriology. Lectures on the morphology and physiology of the bacteria, the principal bacterial diseases, and the rôle of bacteria in the arts and industries. Mr. Werkenthin.

Required of all Agricultural students (excepting those in the Animal Husbandry and Dairy Husbandry course) and of Juniors in Home Economics. 3 credits: 3 lectures.

9–a, 10–b, 11–c. Bacteriology. Lectures and laboratory work on the morphology, taxonomy and physiology of the bacteria, the technique of isolation, and the principles of sterilization. Special attention is given to the bacteriological analysis of water, milk, and soils. Mr. Werkenthin.

Required of Animal Husbandry and Dairy Husbandry students. Students required to take Botany 8–a may substitute this subject on approval of the instructor. 3 credits: 1 lecture; 2 laboratories.

12–a. Plant Pathology. The fungous diseases of plants; their symptoms, cause and prevention. Mr. Doran.

Prerequisite: Botany 3–c. Required of Seniors in Horticulture, Forestry and Teacher Training. 3 credits: 1 lecture; 2 laboratories.

13–b. Plant Pathology. A continuation of 12–a.

Prerequisite: Botany 12–a. Required of Seniors in Horticulture, Forestry and Teacher Training. 2 credits: 2 laboratories.

14–b. Fungous Diseases of Plants. The principal fungous diseases, their cure and prevention. The subject is designed to give the student such training in the identification of the common fungous maladies of our agricultural crops as will be serviceable in farming, school garden work, or any position in the field of plant industry in which elementary knowledge is sufficient or desirable. Mr. Doran.

2 credits: 1 lecture; 1 laboratory.

15–a, 16–b, 17–c. Advanced Botany. The subject-matter will depend upon the training and desire of the student. It cannot be elected without previous consultation. Mr. Butler and Mr. Werkenthin.

Credit hours by arrangement, one or more terms.

DAIRY HUSBANDRY

JOHN M. FULLER, *Professor*
HEBER F. DEPEW, *Instructor*
B. E. HUGGINS, *Assistant*

1–b. Farm Dairying. A general survey of the field of dairy husbandry. Such topics as the use of the Babcock test, farm separators, farm buttermaking and farm cheesemaking, and marketing dairy products, are included. Mr. Fuller.

Required of Sophomores in Agriculture. 4 credits: 3 lectures; 1 laboratory.

2–c. Dairy Cattle Judging. Animals in college herd and in nearby herds will be judged. Mr. Fuller.

All students interested in the dairy cattle judging team should elect this subject. 2 credits: 1 lecture; 1 laboratory.

3–a, 3.5–b. Milk Production. The field of dairy husbandry in its relation to the producer. Feeding dairy animals; systems of herd feeding; silage and soiling; raising dairy animals; dairy herd development; dairy barns; advanced registry management; fitting dairy animals for show; dairy cattle judging. Mr. Fuller.

Elective for Seniors. 4 credits: 3 lectures; 1 laboratory.

4–a. Testing Dairy Products. A thorough study of the Babcock test, with special work in testing various dairy products for butter fat; acidity tests for milk and cream; moisture tests for butter and cheese; use of lactometer. Mr. DePew.

Prerequisite: Dairy Husbandry 1–b or 8–a. Elective for Juniors. 4 credits: 2 lectures; 2 laboratories.

5–b. Market Milk. Food value of milk; production, handling and distribution of market and certified milk; dairy farm inspection; control of milk supply. Mr. DePew.

Prerequisite: Dairy Husbandry 1–b or 8–a. Required of Juniors in Animal and Dairy Husbandry. 4 credits: 3 lectures; 1 laboratory.

6–b. Ice Cream and Cheesemaking. (1) Lectures and laboratory work covering the manufacture of the more important types of cheese

(2) The making, handling, and marketing of ice cream and ices. Mr. DePew.

Prerequisite: Dairy Husbandry 1–b or 8–a. Elective for Juniors and Seniors. 4 credits: 2 lectures; 2 laboratories.

7–c. Buttermaking. A study of the secretion and of the chemical and physical properties of milk; pasteurization; cream ripening, starters, churning; organization and operation of factories. Mr. DePew.

Prerequisite: Dairy Husbandry 1–b. 4 credits: 2 lectures; 2 laboratories.

8–a. Domestic Dairying. Nutritive value of milk; market milk; modified milk; certified milk; condensed milk; milk powder; fermented milk; butter; cheese; and ice cream. Laboratory exercises are given in the manufacture of dairy products. Mr. DePew.

Elective for Juniors and Seniors in Home Economics and in Arts and Science courses. 3 credits: 2 lectures; 1 laboratory.

9–c. Dairy Bacteriology. Methods of bacteriological analysis of milk and its products; isolation and study of the different types of dairy bacteria; relation of bacteria to milk and its products; study of effect on bacteria in milk of separation, clarification, pasteurization, aeration, and straining; and the application of bacteriological principles to the dairy industry. Mr. DePew.

Prerequisite: Botany 11–c. Elective for Seniors in Animal Husbandry and Dairy Husbandry course. 3 credits: 1 lecture; 2 laboratories.

10–c. Dairy Research. A study of experiment station and other dairy literature. Mr. Fuller.

1 credit: 1 lecture.

13–a. Dairy Management. Care and feeding of dairy animals; farm dairy buildings; dairy herd development; manufacture and marketing of dairy products; cow test associations. Mr. Fuller.

Required of Teacher Training Juniors. 4 credits: 3 lectures; 1 laboratory.

ENTOMOLOGY

WALTER C. O'KANE, *Professor*
CLARENCE R. CLEVELAND, *Assistant Professor*

1-a. **Principles of Economic Entomology.** The relation of the structure and classification of insects to methods of insect control. The preparation and application of insecticides. Spray machinery and appliances. Mr. O'Kane and Mr. Cleveland.

Required of Sophomores in Agriculture. Elective for Sophomores, Juniors and Seniors in other courses. 4 credits: 3 recitations; 1 laboratory.

2-a. **Insects of Orchard and Garden.** The application of methods of insect control to typical injurious species. Studies in the life histories and habits of important insect pests of orchard, garden and certain field crops. Adapted especially for students in Horticulture and in General Agriculture. Mr. Cleveland.

Prerequisite: Entomology 1-a. Required of Juniors in Horticulture and Teacher Training courses, and elective for other Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

3-b. **Insects of Domestic Animals.** The insect enemies of domestic live stock; their life histories, habits and means of their control. Adapted especially for students in Animal Husbandry. Mr. Cleveland.

Prerequisite: Entomology 1-a. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

4-c. **Household Insects. Medical Entomology.** The life histories, habits and means of control of insects of the household and of stored products. The relation of insects to disease. Adapted especially for students in Home Economics. Mr. O'Kane and Mr. Cleveland.

Elective for Sophomores, Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

5-a, 6-b, 7-c. **Advanced Economic Entomology.** Detailed studies of problems involved in applied entomology. The literature of economic entomology. Investigational methods. Practice in arranging projects. Original investigations in the life history and habits of one

or more injurious species. Adapted for advanced students. Mr. O'Kane and Mr. Cleveland.

Elective for Juniors and Seniors. Open to students only by permission of head of department. Credits and hours to be arranged.

8–c. **Forest Insects.** Studies in the life histories and habits of the more destructive forest insects and the means of their control. Especially adapted for students in Forestry. Mr. Cleveland.

Prerequisite: Entomology 1–a. Required of Seniors in Forestry. Elective for others. 3 credits: 2 lectures; 1 laboratory.

FORESTRY

KARL W. WOODWARD, *Professor*
ALBERT W. GAMASH, *Instructor*

1–c. **Principles of Forestry.** This subject is intended to meet the needs of students of Agriculture who desire an intelligent appreciation of the possibilities of the farm woodlot, and of others who wish to obtain a general knowledge of the principles of forestry. The value of forests, their protection, their utilization, their improvement, and regeneration are all discussed with special reference to New Hampshire conditions. Mr. Woodward.

Required of all Sophomores in Agriculture. 4 credits: 3 lectures; 1 laboratory.

2–a. **Dendrology.** In this course are considered the uses and grades of lumber and other wood products, the identification of woods and the identification of our native tree species. Mr. Gamash.

Required of Juniors in Forestry. 4 credits: 2 recitations; 2 laboratories.

3–a, 4–b, 5–c. **Silviculture.** The growing of timber crops, including the laws of forest growth, the improvement of immature stands, and forest regeneration both natural and artificial. Lectures and recitations, supplemented by field practice. Mr. Woodward.

Required of Juniors in Forestry. 3 credits: 2 lectures; 1 laboratory.

6–b. **Forest Mensuration.** Principles and methods of scaling logs and cord wood and estimating lumber; also a study of the diameter,

height, growth and yield of the commercial tree species found in New Hampshire. Mr. Gamash.

Required of Juniors in Forestry. 4 credits: 2 lectures; 2 laboratories.

7–b, 8–c. Forest Management. The management of woodlots and large forest tracts for the purpose of gaining the largest immediate and future returns; and the preparation of working plans to coördinate the lumbering, protection, improvement, and regeneration of forests so as to make them yield the highest net returns. Mr. Woodward.

Prerequisites: Forestry 2–a, 5–c and 6–b. 3 credits: 1 lecture; 2 laboratories.

9–a. Forest Protection. Consideration of measures for the protection of forests from fire, insects, fungous diseases, grazing, trespass, and taxes; and an examination of the federal and state laws relating to forest interests. Mr. Gamash.

Prerequisite: Forestry 1–a. Required of Seniors in Forestry. 3 credits: 1 lecture; 2 laboratories.

10–a, 11–b, 12–c. Advanced Forestry. Work to be arranged according to the needs of individual students. Mr. Woodward.

Prerequisites: Forestry 2–c, 5–c, and 6–c. Elective for Seniors in Forestry. 3 credits: 3 recitations.

13–b. Forest Utilization. A study of the methods and costs of logging, sawmilling and marketing, with special reference to the portable sawmill type of operation. Mr. Gamash.

Required of Juniors in Forestry. 3 credits: 2 lectures; 1 laboratory.

14–c. Practice of Forestry. Development and present status of forestry in different countries; the work of the federal government and its management of the national forests; state forest policies; the lumber industry in the United States. Lectures and special readings. Mr. Woodward.

Prerequisites: Forestry 2–a, 5–c and 6–b. Required of Seniors in Forestry. 4 credits: 4 recitations.

15–c. Town Forest Problems. A detailed study, for one who has had Forestry 1–c, of the forest problems of his home town. Aimed to

prepare those who are planning to settle in a definite locality to become expert in timber estimating and valuation, and artificial and natural regeneration in that locality. Individual conferences and reports. Mr. Woodward.

Prerequisite: Forestry 1-a or (Forestry 51—1918-1919 catalog). 3 credits: 1 recitation; 1 laboratory.

HORTICULTURE

Joseph H. Gourley, *Professor*
William H. Wolff, *Associate Professor*
J. R. Hepler, *Assistant Professor*
James Macfarlane, *Instructor*

1-c. **Vegetable Gardening.** This subject is designed to give a working knowledge of the various phases of vegetable production. It includes a study of garden soils, germination and planting of seeds, selection of varieties with reference to conditions in the state, construction and management of hot beds and cold frames, fertilizing, irrigation, and the packing and marketing of vegetables. Mr. Hepler.

Required of Sophomores in Agriculture. 3 credits: 2 recitations; 1 laboratory.

2-a. **Greenhouse Construction and Management.** This subject aims to familiarize the student with modern methods of greenhouse work and the more important plants grown under glass. Sorts, varieties, culture, marketing, and enemies of greenhouse plants are studied. Each student is required to do practical work in propagating, potting, watering and ventilating. A study is made of the history and development of different types of greenhouses, including methods of heating and general management. Mr. Hepler.

Required of Juniors in Horticulture. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

3-c. **Practical Pomology.** A study of the fundamental problems of fruit growing; such as location, choice of site, kind and adaptability of soil for fruit growing, soil management, planting of orchards, pruning, sprays and spraying, thinning, harvesting and marketing. Mr. Wolff.

Required of Sophomores in Agriculture. 3 credits: 2 recitations; 1 laboratory.

4–b. Viticulture and Small Fruit Culture. A comprehensive study of the grape and small fruits, such as the strawberry, raspberry, blackberry, currant and gooseberry. Each fruit is studied with reference to its history, classification, propagation, planting, pruning, injurious insects and diseases, picking and marketing. Mr. Wolff.

Required in Horticultural course. 3 credits: 2 recitations; 1 laboratory.

5–a. Systematic Pomology and Commercial Orcharding. A study of fruit varieties with special reference to those adapted to New England conditions. Both tree and fruit characteristics are studied, and the student is required to recognize at sight the common varieties of fruits grown in this locality. In the laboratory special instruction is given in the packing of apples for market and in the judging of fruit. Mr. Gourley.

Required of Seniors in Horticulture. 3 credits: 2 recitations; 1 laboratory.

6–b. Advanced Pomology. This subject deals with the management of commercial orchards, problems of marketing, transportation and coöperation. Special study is made of the experimental data which underlie orchard practices. Mr. Gourley.

Required of Seniors in Horticulture. 3 credits: 2 recitations; 1 laboratory.

7–c. Landscape Gardening. A study of the principles involved in ornamental and landscape gardening. Special attention is given to the beautifying of home surroundings. Laboratory work consists in landscape design and practice in laying out and planting home and public grounds. Mr. Hepler.

Required of Juniors in Horticulture. 4 credits: 2 lectures; 1 recitation; 1 laboratory.

8–c. Nursery Management. A study of the methods of propagation and the care of trees, shrubs and perennial plants in the nursery. Lectures, reference readings and practice. Mr. Wolff.

Required of Juniors in Horticulture. 3 credits: 2 recitations; 1 laboratory.

9–b. Floriculture. A special study of the classification, history and development of the flowers and plants grown commercially and about

the home, together with instruction and practice in their propagation and culture. Mr. Macfarlane.

Elective for Juniors in Horticulture. 3 credits: 2 recitations; 1 laboratory.

10-c. **Evolution and Improvement of Plants.** The application of the principles of evolution to the improvement of plants. Variation, selection and heredity as applied to the problems of plant breeding in agricultural practice. Mr. Gourley.

Required of Seniors in Horticulture and Juniors in Teacher Training. 3 credits: 3 recitations.

11-b. **Vegetable Forcing.** A subject dealing with the study of special vegetables as grown under glass. Emphasis is placed upon the commercial phases of the work, including varieties, culture, style of packages, and marketing. Each student is required to grow crops from seeding to maturity. In addition, a study of vegetable classification is given. Mr. Hepler.

Required of Juniors in Horticulture. 3 credits: 1 lecture; 2 laboratories.

12-c. **Horticultural Seminar.** A review of the important horticultural literature and methods of investigational work. Mr. Gourley.

Required of Seniors in Horticulture. 1 credit: 1 seminar meeting.

13-c. **Vegetable Gardening.** This subject takes up the problems of home and school gardening. It includes the study of methods of laying out and handling home, school and community gardens, choice of crops and varieties, their adaptation to local soil conditions, and the culture, displaying and judging of home garden vegetables. Mr. Hepler.

Elective for women students. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

14-a, 15-b, 16-c. **Advanced Horticulture.** Special work in horticulture may be taken by arrangement with the head of the department. Mr. Gourley.

Prerequisites will depend upon the work taken. Elective for Seniors in Horticulture. 2 to 5 credits: 2 to 5 exercises.

POULTRY HUSBANDRY

ALTON W. RICHARDSON, *Professor*

1–a, 2–b. **Farm Poultry.** A general subject in poultry husbandry, taking up the origin and history of the breeds, housing, incubation, brooding, breeding, feeding, marketing, and general management. Mr. Richardson.

Required of Sophomores in Agriculture. 3 credits: 2 lectures; 1 laboratory.

3–b, 4–c. **Home Poultry for Girls.** A subject designed to aid in giving a practical knowledge of poultry to girls who are taking the course in Home Economics, and also to any girls in the Arts and Science courses who may be interested. Mr. Richardson.

3 credits: 2 lectures; 1 laboratory.

5–a. **Poultry Management.** A subject in poultry management in which the students lay out plans and make drawings for a 1,000-bird poultry plant, taking into consideration every phase of management. Mr. Richardson.

Prerequisites: Poultry 2–b or 4–c. Elective for Juniors and Seniors. 3 credits: 3 lectures.

6–b. **Poultry Diseases.** A subject treating of the anatomy of the fowl, with clinics showing various common poultry diseases, and lectures giving methods of prevention and cure. The question of poultry sanitation and hygiene is also studied. Mr. Richardson.

Prerequisites: Poultry 2–b or 4–c. Elective for Juniors and Seniors. 2 credits: 2 lectures.

7–c. **Incubation.** A study of the theories involved in incubation and brooding, with each student running an incubator, keeping records of fertility and hatchability, running the brooder, and keeping records of the mortality of the chicks. Mr. Richardson.

Prerequisites: Poultry 2–b or 4–c. 3 credits: 2 lectures; 1 laboratory.

8–a. **Poultry Seminar.** A seminar subject where each student studies various recent bulletins of important poultry topics, writes abstracts of them and delivers to the class an opinion on the bulletins in

question. An opportunity for students to do research work in poultry husbandry. Mr. Richardson.

Prerequisites: Poultry 2–b or 4–c. Elective for Juniors and Seniors. 3 credits: 3 lectures.

9–c. Poultry Feeding. A subject dealing with the principles of feeding and the comparative value of various feeds and grains used in poultry feeding. Each student will be obliged to feed a pen of hens and a brood of chicks, getting actual practice in manipulating an oat sprouter, and doing all the feeding involved in the care of the hens and chicks. Mr. Richardson.

3 credits: 2 lectures; 1 laboratory.

10–a. Poultry Breeding. A subject giving the theories and practice involved in breeding for egg production and for feathers; practical work in selecting the breeding stock, with special consideration as to their utility. Mr. Richardson.

Prerequisites: Poultry 2–b or 4–c. Elective for Juniors and Seniors. 2 credits: 2 lectures.

11–b. Poultry for Teachers. This subject will include certain advanced considerations of poultry feeding, breeding, incubation, diseases and management arranged specially to suit the needs of Teacher Training students and will be open to them only. Mr. Richardson.

2 credits: 1 lecture; 1 laboratory.

12–c. Poultry Brooding. The work in this subject will include the care, feeding and management of a brood of chickens throughout the term. Mr. Richardson.

Required of Teacher Training Juniors. 1 credit: 1 laboratory.

ARTS AND SCIENCE DIVISION

ERNEST R. GROVES, *Dean*

DEPARTMENTS

ECONOMICS
ENGLISH
GEOLOGY
HOME ECONOMICS
LANGUAGES
SOCIOLOGY
EDUCATION AND PSYCHOLOGY
HISTORY AND POLITICAL SCIENCE
METEOROLOGY AND ASTRONOMY
MUSIC
ZOÖLOGY

[**ASTRONOMY**—See page 115.]

ECONOMICS

MARION O'K. MCKAY, *Professor*

1-a, 2-b. The Principles of Economics. This subject is designed to acquaint the student with the general principles of the science which deals with the activities of man in securing a living. Such topics as the following will receive attention: the characteristics of the present economic system; the evolution of economic society; production and consumption; value and exchange; value and price; money, credit and banking; international trade; protection and free trade; the kinds and nature of wealth; its distribution in the form of rent, wages, interest, and profits. In addition to the foregoing, certain selected economic problems, such as transportation, insurance, socialism and agricultural problems will be considered. The elements of public finance will receive some attention.

Elective for Sophomores, Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

3-c. Industrial and Commercial Geography. A survey of the facts and principles of industry and commerce, and a brief consideration of the commercial development of nations. Particular attention will be given to the importance of natural and physical conditions as determinants of commercial development. Ocean traffic and the more important trade routes will receive attention. The more important commodities of commerce, the regions of their production, and the markets to which they are sent are studied. Finally, attention will be given to commerce

and industry during the war, and to the steps taken since the close of the war looking towards commercial and industrial development.

Elective for Freshmen and Sophomores. 3 credits: 1 lecture; 2 recitations.

4–a. **Labor Problems.** This subject will in the main be concerned with what may be called modern problems of organized labor. The background and the structure of labor organizations will be studied first. Thereafter attention will be directed to strikes and their causes, lock-outs, boycotts, the open and closed shop, arbitration, the trade agreement, restriction of membership and output, legislative methods, labor legislation, labor parties. Some attention will be given to labor problems in connection with the prosecution of the war. Lastly the American Federation of Labor, the Industrial Workers of the World, and Bolshevism will be considered.

Economics 4–a and 7–a will be given alternate years.
Economics 4–a will be given in 1920–21.
Prerequisite: Economics 2–b. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

5–b. **Money and Banking.** A subject to acquaint the student with the principles and functions of money; the history of coinage in the United States; the money system in the United States; the value of money and prices; bi-metallism; credit; the origin and development of banking; the banking systems of England, France, Germany and Canada; the National Banking System of the United States; the Federal Reserve System; domestic and foreign exchange; savings banks; and trust companies.

Prerequisite: Economics 2–b. Economics 5–b and 10–b will be given in alternate years. Economics 5–b will be given in 1920–21. 3 credits: 2 lectures; 1 recitation.

6–c. **Principles of Public Finance.** This subject aims to acquaint the student with the fundamental principles of public finance. A brief survey will be given of the enormous increases in the expenses of modern governments. The different methods of raising funds to meet the increasing expenses will be examined. Particular attention will be given to the theory and practice of taxation, recent reforms in taxation, war loans, and to taxation in New Hampshire.

Prerequisite: Economics 2–b. The student is urged to take Economics 7–a and 5–b before taking this subject. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

7–a. Corporations. The subject-matter of this subject deals with the general nature of business organization, the evolution and forms of business organization; a study of selected typical business corporations; and finally, public policy towards the corporation and trust problems. The Sherman Act, the Clayton Act, and the Webb-Pomerence Law will be considered. Particular attention will be given to corporation finance.

Prerequisite: Economics 2–b. The student is advised to take Economics 4–a before taking this subject. Economics 4–a and 7–a will be given in alternate years. Economics 7–a will be given in 1921–1922. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

8–b. Rural Economics. Attention will first be directed to the beginnings of agriculture and to its development especially in the United States. Next will be considered the factors of agricultural production, farm management, the distribution of the agricultural income, marketing, coöperative organization, the federal farm loan banks, and price fixing by federal authority.

Required of Seniors in Agriculture. Elective for other Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

9–b. Economic History of the United States. This subject aims to give a general survey of the economic history of the United States. Some attention is given to the study of the Industrial Revolution in Europe. Other topics considered are: early industries in the American colonies, English colonial policy, commerce, transportation, currency and banking, population and labor, slavery, agricultural machinery, economic integration and industrial organization.

Prerequisite: Economics 2–b. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

10–b. Transportation. This subject is concerned chiefly with the problems of railroad transportation in the United States. Particular attention is given to railroad finance and to federal control of the railroads during the recent war.

Prerequisite: Economics 6–c. Elective for Juniors and Seniors. Economics 5–b and 10–b will be given in alternate years. Economics 10–b will be given in 1921–1922. 3 credits: 1 lecture; 2 recitations.

11–c. Economic History of Modern Europe. The purpose of this subject is to inquire into the origin, the nature and effects of the more

important economic changes and achievements in Europe during the last three hundred years. Particular attention will be given to the more recent developments in Great Britain, France and Germany.

Prerequisite: Economics 2–b. Elective for Juniors and Seniors. 3 credits: 3 recitations.

12–a, 13–b, 14–c. **Business Accounting.** A study of the fundamental principles of accounting, first in private or individual business, then the partnership, and closing with the corporation. Interpretation of accounts, business statements and records. The subject is intentionally made to cover a broad field in order that it may be of the greatest service to students from all three divisions, both men and women.

Elective for Sophomores and Juniors in Arts and Science and for Seniors from all divisions. 3 credits: 2 recitations; 1 laboratory.

15–a, 16–b. **Cost-Accounting.** The study of cost-accounting as it operates in a modern manufacturing concern. The student handles and becomes familiar with the best cost-keeping forms and records. Careful study is made of costs, especial attention being given to overhead expense or burden, including the problems of depreciation and idle factor time.

Prerequisite: Economics 14–c. Elective for Sophomores and Juniors in Arts and Science and for Seniors from all divisions. 3 credits: 2 recitations; 1 laboratory.

17–b, 18–c. **Advanced Accounting.** Special study will be made of banking, corporation, and public utility accounting. This is largely a practical course making practical application of the theory of the previous subjects. The student will have an opportunity to select his specialty and will be given special work in that field.

Prerequisite: Economics 14–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

19–b, 20–c. **Auditing Theory and Practice.** Study of various kinds of audits, and their values; duties and responsibilities of the auditor; his report, certificates, etc. Special problems and model reports supplement the theory in the subject.

Prerequisite: Economics 14–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

25–c. Marketing. The object of this subject is to acquaint the student with the many problems of marketing, especially with those connected with the marketing of farm products.

Prerequisite: Economics 8–b and Economics 2–b. Elective for Juniors and Seniors. 3 credits: 1 lecture; 2 recitations.

EDUCATION AND PSYCHOLOGY

CHARLES L. SIMMERS, *Professor and Head of Teacher Training*
ISA A. GREENE, *Associate Professor, Home Economics Education*
WALDO B. COOKINGHAM, *Assistant Professor, Agricultural Education*
—— —— *Assistant Professor, Industrial Education*

The training of teachers for high schools is recognized as one of the important functions of New Hampshire College. In order to do this more adequately a Department of Education and Psychology has been established which has as its aims:

1. To offer prospective high school teachers, principals, and superintendents the necessary technical training for their profession.

2. To present educational history and educational problems in their more philosophic and scientific aspects so that they may be valuable to all college students preparing to become teachers.

To this end, it is expected that all students intending to teach will elect at least the following subjects in the Department of Education and Psychology, making a total of twenty term hours; Education 10–b, 11–c, 21–a, or 22–a and 28–c, and Psychology 1–b, 2–c and 24–b.

The prospective teacher should take either the general or Teacher Training course in Agriculture, Industrial Engineering, or in Home Economics. If registered in the Arts and Science Division, he should major in the Department of Education, or elect a major and one or two minors in the several departments of the division. The aim should be to attain as intensive and extensive an education as possible during the four years spent in college.

The state of New Hampshire has accepted the provisions of the Smith-Hughes Act for training teachers of agriculture, home economics, and industrial education. New Hampshire College has been designated as the one state institution for the training of teachers in these subjects. Under the same Act New Hampshire has accepted federal money for the purpose of paying increased salaries in schools to be known as Smith-Hughes high schools. Students wishing to be prepared to teach in these schools should confer with the head of the Department of Education.

EDUCATION

10–b. Secondary Education. A systematic study of secondary school problems is made. Some of the topics considered are: value of scholarship, qualities of the efficient teacher and his relation to the various elements of the school community, standards of professional conduct, school law, etc. Lectures, assigned readings and discussion. Mr. Simmers.

Prerequisite: Psychology 2–c. Required of Juniors in Home Economics, Agriculture and Industrial Teacher Training courses. Junior subject. 2 credits: 2 recitations.

11–c. Secondary Education. A continuation of 10–b. Some of the topics are: broadening purposes of high-school instruction; how to manage the class; selection and arrangement of subject-matter; types of learning involved in high-school subjects; practice or drill; reflective thinking; training in expression, interest and learning; supervised study; conversational methods; laboratory methods; the art of questioning; lesson planning, etc. Each student is required to make systematic observations in schools near Durham. Lectures, assigned readings, reports and discussion. Mr. Simmers.

Prerequisite: Education 10–b. Required of Juniors in Home Economics, Agriculture and Industrial Teacher Training Courses. Junior subject. 3 credits: 3 recitations.

12–b. Secondary Education. Similar to 11–c. To be taken with Education 10–b. Mr. Cookingham.

Prerequisite: Psychology 10–a. Required of Juniors in the Agriculture Teacher Training course. Not open to other students. Junior subject. 3 credits: 3 recitations.

20–a. History and Principles of Vocational Education. Some of the topics considered are: primitive industry and educational practice; industrial activity in the monasteries; the apprenticeship system; the Fellenberg Institute at Hoffwyl; the manual training, industrial, agricultural and home economics movements; vocational guidance, federal and state legislation concerning vocational education. Typical industrial, trade, evening, continuation, part time, home economics and agricultural schools will be studied. Lectures, assigned readings, and discussion. Mr. Simmers.

Required of Seniors in Agriculture, Home Economics, and Industrial Teacher Training courses. Not open to other students. Senior subject. 3 credits: 3 recitations.

*21–a. **History of Education.** Before and during the Middle Ages. An attempt is made to show the relationship between the industrial, intellectual, social, philosophic, and religious ideals of the times, and the varying conceptions of aim, method, curricula, and organization of educational agencies. Lectures, assigned readings, and discussion. Mr. Simmers.

Open only to Juniors and Seniors, except by permission. Senior subject. 3 credits: 3 recitations.

*22–a. **History of Education.** Modern Period. This subject is quite similar to Education 27–c in aim and method of treatment. It deals with the progress of society and related educational problems from the time of Comenius (beginning of seventeenth century) to the present time. It also attempts to show the origin and evolution of present theory and practice in education. Lectures, assigned readings and discussion. Mr. Simmers.

Open only to Juniors and Seniors, except by permission. Senior subject. 3 credits: 3 recitations.

25–b. **Principles of Education.** In this subject a general background for educational thought and practice is sketched. The biological, psychological, social and ethical bases of education are considered. The aim is to give underlying principles and to show how they should function in the work of the grades and the high school. The subject is fundamental for those students intending to become principals or superintendents of schools. Lectures, assigned readings and discussion. Mr. Simmers.

Prerequisite: Education 11–c. Senior subject. 3 credits: 3 recitations.

26–b. **The School Principalship.** The functions of the principal or head master, his relation to patrons, board of education, superintendent; discipline, grading, promotion, school law, teachers' meetings, educational measurements, school records, reports, etc. This subject should be elected by both men and women who wish to become principals of small school systems, and later, head masters. Those who elect this subject should have taken Psychology 2–c, Education 11–c, 21–a or 22–a, and should also take Psychology 24–b, Education 25–b, and 28–c. Also one or more subjects in "Special Methods in Education" should be

* Education 21–a and 22–a are given in alternate years. Education 22–a is given in 1920–1921.

taken. Lectures, assigned readings, reports, and discussion. Mr. Simmers.

Senior subject. 2 credits: 2 recitations.

27–c. School Hygiene. Similar in content to 28–c, though not covering as many topics. To be taken in absentia by Smith-Hughes Teacher Training students while doing supervised practice teaching away from the college. Mr. Simmers.

Required of Seniors in Home Economics, Agriculture and Industrial Teacher Training courses. Assigned readings, problems, and examination. 2 credits.

28–c. School Hygiene. The physical welfare of the pupil is considered in relation to his moral, social and intellectual development. Hygiene of play, study, work, daily programs, the selection of school-building site, heating, ventilation, medical inspection, communicable diseases, detection and treatment of defects of the senses, causes of fatigue and its relief and prevention, etc., are studied. Lectures, assigned readings and discussion. Mr. Simmers.

Senior subject. 3 credits: 3 recitations.

29–a–b–c. Supervised Practice Teaching. At some time during his senior year each student majoring in the Department of Education will be required to spend at least two weeks doing supervised practice teaching in the public high schools near Durham. The work will be under the direction of the head of the Department of Education. Mr. Simmers.

Open only to Seniors majoring in the Department of Education and Psychology. 2 or 3 credits.

30–a. Home Economics in the High School. History of the development and growth of Home Economics. Consideration of its place in Education. Correlation of Home Economics with other subjects in the curriculum. Study of federal, state and local enactments to promote Home Economics. Consideration of present courses of study. Formation of a model course or courses of study to meet present needs, and making list of best text books, reference books, laboratory equipment and individual student equipment. Observation of classes and conferences on work observed. Miss Greene.

Prerequisite: Education 11–c. Open only to Seniors in the Home Economics Teacher Training course. 3 credits: 3 recitations.

31–b. Home Economics in the High School. A consideration of Home Economics in the Junior and Senior high schools in the state of New Hampshire. Careful consideration of the state course of study with the view of teaching it in the state. Visits to nearby high schools to note equipment, etc. Review of college work to insure correct interpretation of principles and methods of presentation of the subject matter. Demonstrations and class observation. Lesson plans made and necessary material for classroom work compiled. Miss Greene.

Open only to Seniors in the Home Economics Teacher Training course. 3 credits: 3 recitations.

32–c. Supervised Practice Teaching in Home Economics. Each Senior in the Teacher Training course will spend at least nine weeks as an apprentice teacher in some high school selected by the State Commissioner of Education and the head of the Department of Education at New Hampshire College. This work will be under the regular teacher of Home Economics in the high school and will be supervised by the instructor in Home Economics Education at New Hampshire College. Miss Greene.

Prerequisite: Education 31–b. Required of Seniors in the Teacher Training course and open only to these students. 10 credits.

35–b. Agriculture in the High School. This subject deals with special methods of teaching agriculture in the high school, with emphasis upon New Hampshire requirements as set up by the State Board of Education. The chief topics considered are: planning and equipping of classrooms and shops, cataloging of bulletins for the library, selection of reference books, use and construction of charts and illustrative materials, the curriculum, the yearly plan of work; the presentation of materials of instruction through recitation, laboratory, field work and excursions; teaching through the home project, and supervised study. Mr. Cookingham.

Required of Seniors taking the Teacher Training course, and open only to these students. 3 credits: 2 lectures, 1 laboratory.

36–c. Supervised Practice Teaching in Agriculture. Each senior in the Teacher Training course will spend at least ten weeks as an apprentice teacher in some agricultural high school selected by the State Commissioner of Education and the head of the Department of Education at

New Hampshire College. This work will be under the regular teacher of Agriculture in the high school, and will be supervised by the instructor in Agricultural Education at New Hampshire College. Mr. Cookingham.

Required of Seniors taking the Teacher Training course and open only to these students. 11 credits.

40–b. Special Methods in Industrial Education. Special methods of class management, instruction, aims, educational values, etc., as occur in Smith-Hughes Industrial classes will be considered.

Required of students taking the Smith-Hughes Industrial Teacher Training course, and not open to other students. 3 credits: 3 recitations.

41–c. Supervised Practice Teaching in Industrial Education. During the third term of the Senior year Industrial Teacher Training students will teach in some industrial school in the state, to be chosen by the State Commissioner of Education and the head of the Department of Education at New Hampshire College. At least nine weeks will be devoted to this and no work will be carried at the college during this term. Mr. Cookingham.

Required of students taking the Smith-Hughes Industrial Teacher Training course, and not open to other students. 11 to 16 credits.

Special Methods in:

1. Teaching Manual Arts (see Shop 26–a).
2. Teaching Mathematics (see Mathematics 13–a).
3. Teaching English (see English 17–a).

PSYCHOLOGY

1–b. Introduction to Psychology. A rapid survey of the physiological bases of human behavior is made. The nature of psychology, ts scope and phases, the nervous system and the nature of its action, the various senses and their manner of functioning, habit, attention, etc., are studied. Lectures, assigned readings and quizzes are supplemented by simple laboratory demonstrations and experiments. Mr. Simmers.

This subject must be taken by those who elect other subjects in Psychology and Education. Sophomore subject. 3 credits: 3 recitations.

2-c. Introduction to Psychology. A continuation of 1-b. Perception, memory, reasoning, instinct, feeling, emotion, temperament, will, etc., are treated at length, in a practical and applied manner. Mr. Simmers.

Prerequisite: Psychology 1-b. This subject must be taken by those who elect other subjects in Psychology and Education. Sophomore subject. 3 credits: 3 recitations.

10-a. Elements of Psychology. As complete a study as possible is made of the psychology of the chief learning processes,—sensation, perception, memory, imagination, concept formation, reasoning, instinct, emotion and will. Mr. Simmers.

Required of Juniors in Home Economics, Agriculture and Industrial Teacher Training courses. Not open to other students. Junior subject. 3 credits: 3 recitations.

24-b. Psychology of the Adolescent. A study is made of the growth and development of the physical, psychic, intellectual, moral, social and religious nature of the adolescent boy and girl. The aim is to develop in the student a clearer insight into the nature of youth, particularly those of high school age, so that they can be dealt with in a more sympathetic and helpful manner. Lectures, assigned readings and discussion. Mr. Simmers.

Prerequisite: Psychology 2-c or 10-a. Required of Seniors in Home Economics, Agriculture and Industrial Teacher Training courses. Senior subject. 3 credits: 3 recitations.

ENGLISH

ALFRED E. RICHARDS, *Professor*
CLARENCE W. SCOTT, *Professor*
HAROLD H. SCUDDER, *Associate Professor*
RUTH RICHARDSON, *Instructor*
MRS. MELVIN SMITH, *Instructor*

1-a. English Composition. The chief aim of this subject is a thorough review of English grammar and syntax. Stress is laid also upon such fundamentals of written composition as punctuation, spelling, choice of words, and clearness of sentence structure. Short themes, both prepared and impromptu, and monthly reports upon outside reading are required. Mr. Richards, Mr. Scudder, Miss Richardson, Mrs. Melvin Smith.

Required of all Freshmen. 3 credits: 3 recitations.

2–b. English Composition. A continuation of 1–a. Mr. Richards, Mr. Scudder, Miss Richardson, Mrs. Melvin Smith.

Prerequisite: English 1–a. Required of all Freshmen. 3 credits: 3 recitations.

3–c. English Composition. A continuation of 2–b. This subject adds to the study of the principles of good writing, a training in literary appreciation. The characteristics of exposition, narration, description and argumentation are studied, and frequent themes illustrating these forms of composition are required. This work is supplemented by outside reading and monthly book reports. Mr. Richards, Mr. Scudder, Miss Richardson, Mrs. Melvin Smith.

Prerequisite: English 2–b. Required of all Freshmen. 3 credits: 3 recitations.

4–a. Advanced Composition. A study of English composition in respect to the technique of style, diction and literary form. The reading and discussion of essays by modern writers is supplemented by frequent themes, and by a study of oral English as a form of composition. Mr. Richards.

Prerequisite: English 3–c. Elective for Sophomores and Juniors. 3 credits: 3 recitations.

5–b. Introduction to English Literature. A general survey of English literature from its beginnings to the present day. To one who intends to teach English it is of fundamental importance. Lectures and recitations. Mr. Richards.

Elective for all classes. 3 credits: 3 recitations.

6–a. Writing for Publication. A practical study of the preparation of articles for the newspapers and magazines. It is for all whose vocation will demand frequent writing for publication, and a preparation in part for those who intend to take up newspaper work after graduation. It does not cover the entire field of journalism, but the student will be instructed in the duties of a reporter and be given constant practice in writing news stories. Mr. Scudder.

Prerequisite: English 3–c. Elective for those who have attained a grade of 70 or higher in English 3–c. 3 credits: 3 recitations.

7–c. Public Speaking. A study of the principles and practice of public speaking, including debate. Each student acquires practice in both prepared and impromptu speaking upon topics of the day and subjects of educational value. Mr. Richards.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

8–c. History of the English Drama. A survey of the English drama from its beginnings to the Closing of the Theatres. Constant reading of the plays with written criticisms and reports is required. Mr. Scudder.

Prerequisite: English 3–c. Elective for Sophomores, Juniors and Seniors. 3 credits: 3 lectures.

9–b. The English Novel in the Nineteenth Century. A study of the novel from Jane Austen to Thomas Hardy. There will be lectures, recitations and constant outside reading. Mr. Scudder.

Prerequisite: English 3–c. English 9–b and 22–b will be given in alternate years—(22–b in 1920–21). Elective for Sophomores, Juniors and Seniors. 3 credits: 3 recitations.

10–a, 11–b, 12–c. American Literature. Lectures and extensive outside reading. Mr. Scott.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

13–a. English Poetry. A study of English poetry written between 1798 and 1918. Mr. Richards.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

14–b. Shakespeare's Plays. A study of the principal plays of Shakespeare. Recitations and occasional dramatic representations of famous scenes. A large amount of reading required. Mr. Richards.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

15–b. Comparative Study of the Drama. Reading of selected dramas from Greek, Latin, Spanish, French, Italian, German and Danish literature; from Aeschylus to Ibsen. English drama excluded. Constant reading, written criticisms and reports required. Miss Richardson.

Prerequisite: English 3–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

16–c. **American Drama.** A study of American drama, covering the period beginning with Thomas Godfrey's *Prince of Parthia*, 1767, and ending with plays of recent date. Miss Richardson.

Prerequisite: English 15–b. Elective for Juniors and Seniors. 3 credits: 3 recitations.

17–a. **The Teaching of High School English.** This subject is especially designed for those who major in English. It is the study and application of methods of teaching oral and written composition, poetry, prose, fiction, the essay, drama and oration. Attention is given to outside reading, the school paper, dramatics and other aids to the teaching of English. Miss Richardson.

Prerequisite: English 4–a, and Education 11–c. Elective for Seniors. 3 credits: 3 recitations.

20–c. **The Essay.** A study of the essay as represented in the writings of Lamb, Newman, Ruskin, Hazlitt, Harrison, and as employed by the leaders in the literary and scientific world of today. Mr. Richards.

Prerequisite: English 4–a. English 20–c and 21–c will be given in alternate years—(21–c in 1920–21). Elective for Sophomores, Juniors and Seniors. 3 credits: 3 lectures.

21–c. **John Ruskin.** The reading of selected essays by Ruskin which bear upon the literary, artistic and social problems of the present day. Lectures and recitations. Mr. Richards.

Prerequisite: English 4–a. English 20–c and 21–c will be given in alternate years—(21–c in 1920–21). Elective for Sophomores, Juniors and Seniors. 3 credits: 3 recitations.

22–b. **The American Novel.** A survey of the novel in America from Charles Brockden Brown to the present time. There will be lectures and constant outside reading. Mr. Scudder.

Prerequisite: English 3–c. English 9–b and 22–b will be given in alternate years—(22–b in 1920–21). Elective for Sophomores, Juniors and Seniors. 3 credits: 3 lectures.

23–b. **Chaucer.** Selections from Chaucer's works, and lectures upon the life and times of the poet. Lectures and recitations. Mr. Richards.

Prerequisite: English 3–c and 5–b. Elective for Seniors. 3 credits: 3 recitations.

50–a, b, c. Practice Work in Composition. This subject is required of any student, other than a Senior, whose work has been reported by instructors as being faulty in English, and has been so judged by a committee consisting of the deans of divisions and the head of the English Department. This subject does not give credit toward graduation.

GEOLOGY

C. Floyd Jackson, *Professor*
Ora A. Phelps, *Assistant*

1–a. Elementary Geology. A detailed study of the evolution of the earth, with special emphasis on the dynamic factors responsible for its present surface configuration. Local conditions will be studied, with reference to the factors of erosion, transportation and consolidation. Miss Phelps.

Required of Juniors in Agriculture. Elective for other Juniors and Seniors. 3 credits: 3 recitations.

2–c. Historical Geology. A detailed study of the history of various groups of animals, as recorded in the rocks of the earth's surface. Special attention will be given to the phylogenetic development of the vertebrates. Recitations, lectures and written reports required. Miss Phelps.

Prerequisites: Zoölogy 3–c, or 32–c. Elective for Juniors and Seniors. 3 credits: 3 recitations.

100–b. Clay Products and Building Stones. A study of the origin and distribution of building stones and clay products with special reference to their economic importance. Laboratory work will consist of the examination and testing of samples. Tests and microscopical examinations will be made with an attempt to determine their resistance to weathering, etc. Miss Phelps.

Open only to Juniors in Architectural Construction. 2 credits: 1 lecture; 1 laboratory.

HISTORY AND POLITICAL SCIENCE

Clarence W. Scott, *Professor*
Donald C. Babcock, *Assistant Professor*

HISTORY

In the subjects in history an important place is given to historical reading carried on in the reference room. In some cases a considerable part of the work is written.

1–a. **History of Europe from 476 to 1300.** Recitations and collateral reading. Mr. Babcock.

Elective for Freshmen in Arts and Science. 3 credits: 3 recitations.

2–b. **History of Europe from 1300 to 1492.** Recitations and collateral reading. Mr. Babcock.

Elective for Freshmen in Arts and Science. 3 credits: 3 recitations.

3–c. **History of Europe from 1492 to 1700.** Recitations and collateral reading. Mr. Babcock.

Elective for Freshmen in Arts and Science. 3 credits: 3 recitations.

4–a. **History of Europe from 1700 to 1815.** Recitations and collateral reading. Mr. Babcock.

Prerequisite: History 3–c. Elective for Sophomores. 3 credits: 3 recitations.

5–b. **History of Europe from 1815 to 1871.** Recitations and collateral reading. Mr. Babcock.

Prerequisite: History 4–a. Elective for Sophomores. 3 credits: 3 recitations.

6–c. **History of Europe since 1871.** Recitations and collateral reading. Mr. Babcock.

Prerequisite: History 5–b. Elective for Sophomores. 3 credits: 3 recitations.

7–a. **American History to 1783.** With special reference to the political and constitutional development of the colonies. Mr. Babcock.

Elective for Juniors in Arts and Science 3 credits: 3 recitations.

8–b. **Political and Constitutional History of the United States from 1781 to 1829.** Mr. Babcock.

Elective for Juniors in Arts and Science. 3 credits: 3 recitations.

9–c. **Political and Constitutional History of the United States from 1829 to 1861.** Mr. Babcock.

Elective for Juniors in Arts and Science. 3 credits: 3 recitations.

10-a. **Political and Constitutional History of the United States from 1861 to 1880.** Mr. Babcock.

Prerequisite: History 9-c. Elective for Seniors. 3 credits: 3 recitations.

11-b. **Political and Constitutional History of the United States since 1880.** Mr. Babcock.

Prerequisite: History 10-a. Elective for Seniors. 3 credits: 3 recitations.

12-a. **Political and Constitutional History of England to 1485.** Mr. Babcock.

3 credits: 3 recitations.

13-b. **Political and Social History of England from 1485 to 1714.** Mr. Babcock.

3 credits: 3 recitations.

14-c. **Political and Social History of England since 1714.** Mr. Babcock.

3 credits: 3 recitations.

POLITICAL SCIENCE

1-a. **Laws of Business.** Recitations, supplemented by the discussion of cases. Mr. Scott.

Elective for Sophomores in Arts and Science, and Seniors in Agriculture. 3 credits: 3 recitations.

2-b. **American Constitutional Law.** Recitations, supplemented by a study of the decisions of the United States Supreme Court. Special attention is given to the connection between American consitutions and American political history. Mr. Scott.

Elective for Sophomores, Juniors and Seniors in Arts and Science, and Seniors in Agriculture. 3 credits: 3 recitations.

3-c. **International Law.** Recitations and collateral work. Emphasis is placed on current events and recent developments in world organization. Mr. Babcock.

Elective for Sophomores, Juniors and Seniors. 3 credits: 3 recitations.

4–c. **The State.** The development of government from early forms; the government of modern European states. Recitations and collateral reading. Mr. Babcock.

3 credits: 3 recitations.

5–a. **Civics.** A study of the functions, principles and organization of the American Government.

3 credits: 3 recitations.

7–c. **Political Parties and Practical Politics.** Mr. Scott.

Elective for Sophomores, Juniors and Seniors. 3 credits: 3 recitations.

HOME ECONOMICS

LOUISE KNIGHT, *Professor*
ISA A. GREEN, *Associate Professor*
MARION L. CATON, *Instructor*
BERNICE SMITH, *Instructor*

1–a, 2–b. **Elementary Clothing.** The fundamental principles of hand and machine sewing used in household linens and undergarments. Elementary drafting, cutting and fitting, applied to the making of undergarments, comparing the costs to those of ready-to-wear garments. Darning and mending. Students provide all material subject to the approval of the instructor.

Required of Freshmen in Home Economics Teacher Training course. 2 credits: 2 laboratories; 2 outside hours.

2.5–c. **Drafting and Elementary Dressmaking.** Practice given in drafting, cutting, fitting; alteration and use of commercial patterns with application of these principles to the making of a middy and waist. Students provide all materials subject to the approval of the instructor.

Prerequisites: Home Economics 2–b. Required of Freshmen in Home Economics Teacher Training course. 2 credits: 2 laboratories; 2 hours outside.

3–c. **Textiles and Weaving.** The textile fibres; their sources, production and uses; study of their physical and chemical properties; examination of the fibres and of woven fabrics. Judging of fabrics for personal and household purposes, considering the relative costs, durability and suitability.

Prerequisite: Chemistry 8–c. Required of Sophomores in Home Economics. Expense for trips about $4. 3 credits: 1 recitation; 2 laboratories.

4–a, 5–b, 6–c. Foods and Principles of Cookery. The history, manufacture, production, composition, selection and cost of foods. Principles of cookery applied to preservation and preparation of food, stressing the economic use and combinations of food in serving.

Prerequisites: Chemistry 8–c; Physics 3–c. Required of Sophomores in Home Economics. 3 credits: 1 lecture; 2 laboratories.

7–a, 8–b, 9–c. Food Preparation. This subject is to give a general knowledge of the processes of cookery.

Open to Sophomores, Juniors and Seniors not majoring in Home Economics. It does not satisfy prerequisites for any other subjects. 2 credits: 1 lecture; 1 laboratory.

10–a. General Sewing. A subject in sewing open to those not in the Home Economics course. The problems are individual but the sequence of them is planned with the instructor. Suggested projects are wash dress, wool skirt, wool dress, silk waist, tailored waist, middy.

Open to Sophomores, Juniors and Seniors. 3 credits: 1 lecture; 2 laboratories.

12–a–b. Millinery. Designing and construction of frames; use of different materials in covering frames; making and placing of trimmings; renovating of materials and remodeling and trimming of old hats. All materials provided by students subject to the instructor's approval.

Elective for all Junior and Senior women. 12–b required of Juniors in Teacher Training course. 2 credits: 2 laboratories.

13–a, 13.5–b. Advanced Cookery. Comparative experimental work; modification of recipes; use of different temperatures, fats, leavening agents, and processes, with opportunity to judge results as a basis for scientific food preparation.

Prerequisites: Home Economics 6–c; Zoölogy 35–c. Required of Juniors in Home Economics. 2 credits: 2 laboratories.

14–b. Physiological Chemistry. This subject includes the study of the chemistry of cell structure and nutrition, and is the basis for a deeper and broader study of Nutrition and Dietetics.

Prerequisites: Home Economics 13–a; Chemistry 16–b. Required of Juniors in Home Economics in the Dietitian course. 3 credits: 3 recitations.

15–b. Principles of Human Nutrition. Composition of the body; its relation to the physical universe. The composition, digestion, absorption, assimilation and oxidation of food stuffs. The physiological fuel value of food stuffs. Methods of investigation employed in the study of human nutrition. The food requirements of the body as influenced by activity, size, age, sex. Problems throughout the term. It is hoped that a trip to Boston may be included. Cost about $5.

Prerequisites: Home Economics 9–a; Chemistry 15–a; and Chemistry 16–b as parallel subject; Zoölogy 35–c. Required of Juniors in Home Economics. 3 credits: 3 recitations.

16–c. Nutrition and Dietetics. Continuation of 15–b. Problems in dietary calculations. Comparative physiological values of foods. Application of the principles of human nutrition in the adaptation of diet to varying physiological, social and economic conditions.

Prerequisite: Home Economics 15–b. Required of Sophomores in Home Economics. 3 credits: 2 recitations; 1 laboratory.

17–b. Intermediate Dressmaking. Baby clothes. All materials provided by the student subject to the instructor's approval.

Prerequisite: Home Economics 11–c. Required of Sophomores in Home Economics Teacher Training course. 2 credits: 2 laboratories; 2 hours outside.

18–c. Draping and Advanced Dressmaking. The first problem is the designing, pattern modeling, cutting, fitting and draping on the dress form of an afternoon or party dress. Students provide all materials, subject to the approval of the instructor.

Prerequisite: Home Economics 17–b. Elective only for Juniors in Home Economics who have the approval of the instructor as qualified to carry the work. 4 credits: 2 laboratories; 4 hours outside.

19–c. House Decoration. Application of theory of color and of design in house decoration. Selection of house furnishings; study of values; estimation of costs, and comparisons of sanitary and artistic furnishings.

Prerequisite: Drawing 22–c. Required of Juniors in Home Economics Teacher Training and Home Economics Institutional courses. 2 credits: 2 recitations.

20–c. House Management. A study of the organization of the home, of the principle involved in the care and management of it, in systematic methods of housekeeping, and in the apportionment of the income.

Required of Juniors in Home Economics. 3 credits: 2 lectures; 1 laboratory.

21–a. Home Nursing. Scientific care of the patient under home conditions. Observation of symptons. First aid.

Prerequisite: Zoölogy 35–c. Required of Seniors in Home Economics Teacher Training course. 2 credits: 1 lecture: 1 laboratory.

22–a–b. Practice House. In this subject the actual work of carrying on a home is done in the Practice House under supervision. The girls in a family size group, approximately six, live in the house for a term of six weeks. Each resident student in rotation serves in the capacity of the different members of the family. As hostess the girl assumes all duties of the mother in planning, buying, preparing and serving the meals. The regular college work is carried during the time the girls are in the house.

Prerequisites: Home Economics 20–c. 22–b required of Seniors in Home Economics Teacher Training course. 22–a elective for all other Home Economic students. 3 credits.

24–a, 25–b. Institutional Management. A study of the feeding of institutional groups, considering institutional equipment, organization, and laundering; buying, planning, preparing and serving of meals; methods of keeping records. Laboratory practice will be given in the College Commons. Expenses for trips approximately $10.

Prerequisite: Home Economics 16–c. This subject is required of Seniors in Home Economics Institutional and Dietitian's courses. 4 credits: 2 lectures; 2 laboratories.

26–c. Institutional Practice. Nine weeks of practical work will be given in institutions of different types, such as cafeteria, dormitories, etc. Students specializing in dietetics will be placed in hospitals as student dietitions.

Prerequisite: Home Economics 25–b. Required of Seniors in Home Economics Institutional and Home Economics Dietitian courses. 12 credits.

29–a. **Intermediate Dressmaking.** Wool skirt; wash dress; a made-over problem. This last is to be the renovating and remodeling of a suit or dress into a one-piece dress, or the remodeling of a waist and skirt. All materials provided by the student subject to the instructor's approval.

Prerequisite: Home Economics 2.5–c; Drawing 22–c. Required of Sophomores in Home Economics Teacher Training course. 2 credits: 2 laboratories; 2 hours outside.

LANGUAGES *

RICHARD WHORISKEY, *Professor*
JAMES H. MARCEAU, *Assistant Professor*
RUTH RICHARDSON, *Instructor*
LUCINDA P. SMITH, *Instructor*

FRENCH

*1–a, 2–b, 3–c. **Elementary French.** Elements of French Grammar. Reading of simple stories; conversation and dictation. Mr. Whoriskey.

3 credits: 3 recitations.

4–a, 5–b, 6–c. **French Prose.** Reading and translation; composition; outside reading. Mr. Marceau.

Prerequisite: French 3–c. Freshmen who have offered French for admission are allowed to take French 4–a, French 5–b and French 6–c. 3 credits: 3 recitations.

†7–a, 8–b, 9–c. **French Literature of the Nineteenth Century.** Selections from Hugo, Balzac, Sand, Dumas père, Daudet, Gautier. Composition. Mr. Marceau.

Prerequisite: French 6–c. 3 credits: 3 recitations.

†10–a, 11–b, 12–c. **French Literature of the Seventeenth Century.** Lives and works of the following: Corneille; Racine; Molière; Bossuet; Boileau; Mme. de Sévigné; La Fontaine. Composition. Mr. Marceau.

Prerequisite: French 6–c. 3 credits: 3 recitations.

* Students electing elementary subjects in Modern Language will receive no credit in these subjects unless they complete a full year's work.

† French 16–a, 17–b and 18–c will be given in 1920–1921; French 7–a, 8–b and 9–c in 1921–1922 and French 10–a, 11–b and 12–c in 1922–1923.

13–a, 14–b, 15–c. French Composition and Conversation. Mr. Marceau.

Prerequisite: French 3–c. Recommended for those desiring to teach. 3 credits: 3 recitations.

16–a, 17–b, 18–c. French Literature of the Eighteenth Century. Lives and works of the following: Montesquieu, Voltaire, J. J. Rousseau, Beaumarchais, Buffon.

Prerequisite: French 6–c. 3 credits: 3 recitations.

19–a, 20–b, 21–c. French Contemporary Literature. An advanced subject open to a limited number of qualified students. Lives and works of the following: Brunetière, Bourget, Monod, Sully, Prudhomme, Coppée, Sardou, Rostand, Rod, Loti, Barrès, Bazin.

This subject, conducted entirely in French, will include lectures, discussions, outside reading and themes. Subject will not be offered for less then fifteen students.
Prerequisite: French 9–c, 12–c, or 18–c. 3 credits: 3 recitations.

SPANISH

***1–a, 2–b, 3–c. Elementary Spanish.** Elements of Spanish grammar. Reading of simple stories; conversation and dictation. Mr. Whoriskey, Miss Richardson.

3 credits: 3 recitations.

4–a, 5–b, 6–c. Spanish Prose. Reading and translation, conversation, composition. Miss Richardson.

Prerequisite: Spanish 3–c. 2 credits: 2 recitations.

7–a, 8–b, 9–c. Third-Year Spanish. Readings from Cervantes, Calderon and other Spanish authors. Review of grammar. Dictation and composition, with emphasis on commercial usages. Miss Richardson.

Prerequisite: Spanish 6–c. 2 credits: 2 recitations.

GERMAN

***1–a, 2–b, 3–c. Elementary German.** Elements of German grammar. Reading of simple stories. Mr. Whoriskey, Mrs. Smith.

Required of Freshmen in Chemical Engineering who have not offered German for admission. 3 credits: 3 recitations.

*Student electing elementary subjects in Modern Language will receive no credit in these subjects unless they complete a full year's work.

4–a, 5–b, 6–c. German Prose. Reading and translation. Mrs. Smith.

Prerequisite: German 3–c or its equivalent. Freshmen who have offered German for admission are allowed to take German 4–a, 5–b, and 6–c. Required of Sophomores in Chemical Engineering. 3 credits: 3 recitations.

***7–a, 8–b, 9–c. Goethe.** His life and works. The following books are read and criticized: 1. Hermann und Dorothea; 2. Iphigenie; 3. Torquato Tasso; 4. Egmont; 5. Götz von Berlichingen; 6. Dichtung u. Wahrheit (in part); 7. Die Leiden des jungen Werters; 8. Faust, Part I. Mr. Whoriskey.

Prerequisite: German 6–c. 3 credits: 3 recitations.

***10–a, 11–b, 12–c. Schiller.** His life and works. The following books are read and criticized: 1. Wilhelm Tell; 2. Maria Stuart; 3. Die Jungfrau; 4. Die Braut von Messina; 5. Wallenstein; 6. Don Carlos; 7. Geschichte d. 30 järhrigen Krieges; 8. Ballads. Mr. Whoriskey.

Prerequisite: German 6–c. 3 credits: 3 recitations.

***13–a, 14–b, 15–c. Sudermann.** The following books are read and criticized: 1. Frau Sorge; 2. Der Katzensteg; 3. Teja; 4. Heimat; 5. Johannes; 6. Frenssen's Jörn Uhl. Mr. Whoriskey.

Prerequisite: German 6–c. 3 credits: 3 recitations.

16–c. Scientific German. Mrs. Smith.

Required of Sophomores in Chemical Engineering. 3 credits: 3 recitations.

LATIN

1–a, 2–b. Livy (Book I).

Elective for students who have offered Advanced Latin for entrance. 3 credits: 3 recitations.

3–c. Horace (Odes and Epodes). Mrs. Smith.

Prerequisite: Latin 1–a. 3 credits: 3 recitations.

* German 13–a, 14–b and 15–c were given in 1919–1920; German 7–a, 8–b and 9–c will be given in 1920–1921 and German 10–a, 11–b, 12–c in 1921–1922.

METEOROLOGY AND ASTRONOMY

CHARLES H. PETTEE, *Professor*

1-b. Meteorology. Lectures and quizzes on wind systems, precipitation, humidity, laws of storms and tornadoes, and methods of prediction of atmospheric changes. Mr. Pettee.

Prerequisite: Physics 2. Required of Seniors in Agriculture. 3 credits: 2 lectures; 1 quiz.

1-a. Astronomy. A short cultural subject designed to give the student a simple explanation of the many phenomena constantly exhibiting themselves in the universe and to acquaint him with the present state of astronomic science. Mr. Pettee.

Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 quiz.

POLITICAL SCIENCE—see Department of History and Political Science, page 105.]

MUSIC

MRS. MABEL METCALF REDMAN, *Director of Music*
GEORGE H. DOCKHAM, *Instructor in Voice*

The courses offered by this department are of two groups: I, Theory of Music, including history of music, appreciation of music, and sight singing; and II, Applied Music, including piano study and vocal study. To obtain credit in a theoretical subject, a student must carry in conjunction with such subject a course in applied music.

THEORY OF MUSIC

1-a, 2-b, 3-c. History of Music. A subject comprising a systematic and progressive study of the art of music. Consideration will be given to theories of notation, scales, keys, modes, ear training with melodic and rhythmic dictation, musical terms, brief biographies, and outlines of musical form.

The phonograph, piano and other musical instruments will be made use of, in illustrating this course. Carefully kept note-books are a part of the work. Mrs. Redman.

1 credit: 1 lecture. Work in applied music must be carried in conjunction with this subject for credit. (Fee, $5.00 a term.)

4-a, 5-b, 6-c. Appreciation of Music. A subject designed to develop musical perception and the ability to listen intelligently to the best music. It is concerned with the evolution of rhythm, harmony and melody, and their uses in musical expression. The principal musical forms and schools are analysed through study of the strongest works of the great composers.

Various musical instruments will be used to illustrate this course, and carefully kept note books are required. Mr. Dockman.

1 credit: 1 lecture. (Fee, $5.00 a term.)

7-a, 8-b, 9-c. Sight Singing. A subject designed for the study of the technic required in reading vocal scores at sight. Consideration is given to modulation, altered intervals, rhythmic values, part singing and ear training. Mr. Dockham.

1 credit: 1 lecture. (Fee, $5.00 a term.)

TUITION IN MUSIC

Theory. Each theoretical course per term $5.

Tuition for Courses in Applied Music (Piano and Voice Lessons). One half hour lesson a week per term $15. Two half hour lessons a week per term $30.

Practice Pianos. Arrangements may be made with the Director of Music for the use of the Practice Pianos. Fee slip must be made out and the amount noted paid to the Business Office in advance. One term, one hour a day, $5.00. One term, two hours a day, $7.50.

GENERAL REGULATIONS

Any student in New Hampshire College with a satisfactory record in scholarship in his major course may take at least one hour a day in music, by arrangement with the Director.

The authority to register and assign all applicants for music instruction is vested solely in the Director, who must first be consulted for the arrangement of details of registration, or at any time when information is required that pertains to study in the Department of Music.

Special students may be admitted by arrangements with the Director of Music without registration for other college work.

Students registered for study in the Music Department of New Hampshire College are subject to the same rules and regulations which govern regular students in other courses.

No student is permitted to omit lessons or practice without sufficient excuse, and no refund will be made for absence from lesson or practice or for discontinuance, except in cases of severe personal illness. For

such unavoidable absence, lessons may be made up only by appointment and before the expiration of the term; in no case will more than one half of the total fee be refunded. The Director of Music is final authority in this matter.

Lessons falling on legal holidays, or on special holidays petitioned for by the student body or by special student organizations, which may be granted by the college authorities, will not be made up.

Upon making satisfactory arrangements with the Director of Music for the work desired, the Director of Music will fill out a special "Music Department" Registration Blank and approve the same. The fee noted will then be paid to the Business Office at which time a receipt for payment will be obtained. This must be presented to the instructor of music before the beginning of the second lesson.

The Director of Music will file with the Registrar's Office at the close of each term a statement of all students who have completed the requirements for credit. **All theoretical subjects should be listed on the college registration card; applied music subjects should not be listed on the college registration card.**

SOCIOLOGY

ERNEST R. GROVES, *Professor*

3-a. Poverty. The study of causes of poverty, its relief and the contemporary problems related to it as reported in "The Survey." Mr. Groves.

Elective for Sophomores. 3 credits: 3 recitations.

4-b. Crime. The study of the causes of crime, its treatment and the contemporary problems related to it as reported in "The Survey." Mr. Groves.

Elective for Sophomores. 3 credits: 3 recitations.

5-c. Rural Community Sociology. A study of the social significance, conditions and resources of American country life with the purpose of developing community leadership. Lectures and recitations. Mr. Groves.

Elective for Sophomores. 3 credits: 3 recitations.

9-a. Ancient Altruism. A study of the evolution of social idealism from Plato to the modern era. Lectures and reports. Mr. Groves.

Prerequisites: Any two subjects in Sociology. Elective for Juniors. 3 credits: 3 recitations.

6–b. Modern Altruism. A study of the evolution of modern social idealism among the English-speaking peoples. Lectures and reports. Mr. Groves.

Prerequisites: Any two subjects in Sociology. Elective for Juniors. 3 credits: 3 recitations.

***7–c. An Introduction to General Sociology.** An advanced subject in the principles of Sociology which aims to introduce the student to a systematic sociological interpretation of human association. A seminar course. Mr. Groves.

Prerequisites: Any four subjects in Sociology. Elective for Seniors. 3 credits: 3 recitations.

***8–c. Sociological Research.** This subject provides the student opportunity for individual investigations of sociological problems. Problems. Reports. Mr. Groves.

Prerequisites: Any four subjects in Sociology. Elective for Seniors. 3 credits: 3 recitations.

ZOÖLOGY

C. Floyd Jackson, *Professor*
Alma Drayer Jackson, *Instructor*
Ora A. Phelps, *Assistant*

Courses in the Department of Zoölogy are divided as follows:

Group **A** is primarily for Arts and Science students, pre-medical students and those majoring in Zoölogy. Students from other courses may, however, elect from this group, provided they have the proper prerequisites.

Group **B** includes the required courses in Agriculture and Home Economics, as well as certain other electives for either Agriculture, Home Economics or Arts and Science students.

Group A. Arts and Science Subjects

1–a, 2–b, 3–c. Principles of Zoölogy. An elementary study of the principles of life, its development, structural basis and physiological activity. The subject is continuous throughout the year. This subject is intended to give a practical knowledge of animal life and is required of all pre-medical students and others intending to major in the Department of Zoölogy. Students are strongly advised to carry the laboratory work (Zoölogy 4–a, 5–b, and 6–c) parallel with this subject. Mr. Jackson.

3 credits: 3 lectures.

* 7–c and 8–c given in alternate years. 7–c offered 1920–1921.

4–a, 5–b, 6–c. Elementary Laboratory. Laboratory exercises for the purpose of demonstrating the principles discussed in Zoölogy 1–a, 2–b and 3–c. A much clearer conception of life phenomena will be gained if the laboratory work is carried parallel to the lectures. Mr. Jackson.

Prerequisite: Zoölogy 1–a, 2–b, 3–c, carried as parallel subjects. Required of all students majoring in Zoölogy. Elective for Freshmen. 1 credit: 1 laboratory.

7–a, 8–b, 9–c. Comparative Physiology. A detailed study of human anatomy and physiology, compared briefly with the anatomy and physiology of lower animals. This subject is intended to give a practical knowledge of the human mechanism and its method of operation. Students are strongly advised to carry the laboratory work (Zoölogy 10–a, 11–b and 12–c) parallel with this subject. Mr. Jackson.

Prerequisite: Zoölogy 3–c. Required of all pre-medical students. Elective for Sophomores. 3 credits: 3 lectures.

10–a, 11–b, 12–c. Physiological Laboratory. Laboratory exercises for the purpose of demonstrating the principles in Comparative Physiology (Zoölogy 7–a, 8–b and 9–c). The laboratory work should be carried parallel with the lectures when possible. Mr. Jackson and Miss Phelps.

Prerequisite: Zoölogy 7–a, 8–b, 9–c, carried as a parallel subjects. Elective for Sophomores. 1 credit: 1 laboratory.

13–a, 14–b, 15–c. Hygiene and Sanitation. A detailed study of the principles of health preservation. This subject is continuous throughout the year and should, if possible, be preceded by work in Physiology, although that subject is not a prerequisite. Mr. Jackson.

Prerequisite: Zoölogy 3–c. Elective for Sophomores and Juniors. 3 credits: 3 lectures.

16–a, 17–b, 18–c. Evolution and Genetics. Lectures and assignments dealing with the various problems of evolution and their relation to human life. Evidence of man's origin based on anatomical, embryonic and paleontological data will be discussed. A special emphasis will be given to the racial identity, origin and derivation of the English-speaking people. Work in evolution should, if possible, be preceded by a study of Comparative Physiology (Zoölogy 7–a, 8–b, and 9–c). Mr. Jackson.

Prerequisite: Zoölogy 3–c. Elective for Juniors and Seniors. 3 credits: 3 lectures.

19–a, 20–b, 21–c. Advanced Zoölogy. Arranged to suit the need of students who wish to specialize in Zoölogy. Mr. Jackson.

Prerequisites: This subject may not be elected except by students who have completed at least 18 hours in Zoölogy or Entomology with an average grade of at least 80; and then only on the presentation of a detailed outline of the problems they wish to study. The subject is primarily for graduate students. Open only to students by special permission. Credit and hours to be arranged.

Group B. Agricultural and Home Economics Subjects

30–a, 31–b, 32–c. General Zoölogy. A detailed study of the fundamental principles of life; the nature and physiology of protoplasm; the structure of the cell and the processes of cell division. The structure and physiology of man will be discussed in detail. There will then follow a discussion of the structure, habits, physiology and life history of the different types of animals. The economic aspect of this study will be emphasized so far as possible and its importance and relation to man. The laboratory work will consist of the study and dissection of type forms. Mrs. Jackson and Miss Phelps.

Required of Freshmen in Agriculture. Open only to students of this division. 3 credits: 2 lectures; 1 laboratory.

33–a, 34–b, 35–c. Elementary Physiology and Hygiene. A general survey of the structure and function of the human body, with a study of the fundamental principles of hygiene as applied to the different systems. Collateral readings, written reports and conferences required. Mrs. Jackson.

Required of Sophomores in Home Economics. Open only to students in this course. 3 credits: 2 lectures; 1 laboratory.

***36–a, 37–b, 38–c. Histology.** A detailed study of the structure of the tissues of vertebrate animals, cell specialization and the manner in which tissues are combined into organs. The subject is primarily for students intending to teach Zoölogy, a great deal of attention being paid to preparing microscope slides and general histological technique. Mrs. Jackson.

Prerequisite: Zoölogy 3–c or 35–c. Elective for Juniors and Seniors in Arts and Science. 3 credits: 1 lecture; 2 laboratories.

*Given in alternate years: Zoölogy 36-a, 37-b, and 38-c given in 1919–1920; Zoölogy 39-a, 40-b, and 41-c given in 1920–1921.

*39–a, 40–b, 41–c. **Embryology.** A detailed study of the vertebrate embryo, its method of development, and the relation of the embryo to the parent. The work will be prefaced by the study of the details of cell structure, oögenesis, spermatogenesis, fertilization and segmentation; thus tracing the gradual development of the embryo from the single cell to maturity. The laboratory work will be primarily with the frog and chick embryo. The lectures will include human embryology. Mrs. Jackson.

Prerequisites: Zoölogy 3–c or 35–c. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

42–a. **Physiology of Nutrition.** An advanced subject in the nature and physiology of nutrition. The anatomy and physiology of the alimentary tract and the allied organs of digestion will be discussed in detail. The work will consist of lectures, assigned topics and laboratory experiments on digestion. Mrs. Jackson.

Prerequisite: Open only to Juniors and Seniors having at least 9 hours credit in Zoölogy. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

43–b. **Physiology of Circulation and Respiraton.** An advanced subject in the nature and physiology of the organs of circulation and respiration. The subject will consist of lectures, assigned topics and laboratory experiments on the circulatory and respiratory processes within the body. Mrs. Jackson.

Prerequisite: Open only to Juniors and Seniors having at least 9 hours credit in Zoölogy. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

44–c. **Advanced Neurology.** A study of the structure and physiology of the human nervous system. The laboratory work will consist of a study of the different types of neurons, the nature of nervous impulses, and a detailed study of the nerve tracts in the brain and spinal cord. The structure, and physiology of the sense organs will also be considered. Mrs. Jackson.

Prerequisite: Open only to Juniors and Seniors having at least 9 hours credit in Zoölogy. Elective for Juniors and Seniors. 3 credits: 2 lectures; 1 laboratory.

* Given in alternate years: Zoölogy 36–a, 37–b, and 38–c given in 1919–1920; Zoölogy 39–a, 40–b and 41–c given in 1920–1921.

ENGINEERING DIVISION

CALVIN H. CROUCH, *Acting Dean*

DEPARTMENTS

ARCHITECTURE AND DRAWING	MECHANICAL ENGINEERING
CHEMISTRY	MINERALOGY
ELECTRICAL ENGINEERING	PHYSICS
MATHEMATICS	SHOPS

ARCHITECTURE AND DRAWING

ERIC T. HUDDLESTON, *Professor*
THOMAS J. LATON, *Assistant Professor*
PAUL H. SHRAMM, *Instructor*

These subjects are of an industrial and cultural nature and include the engineering, architectural and industrial-art branches of the subject, adapted to meet the utilitarian requirements of the several departments of the college.

Partial credit may be given for work done in preparatory schools if the work is satisfactory to the department. In order to get credit, the student must submit for examination the work done in the preparatory school. No college credit will be given for work submitted for entrance.

Students are advised not to purchase drawing materials before consultation with the drawing instructor. Instruments will be loaned to students upon a deposit, except that students must provide their own instruments at the beginning of their sophomore year.

1-a, 1.5-b. Engineering Drawing. A study is made of the fundamentals of engineering drawing, including free-hand lettering, the use of drawing instruments, and the solution of drafting problems in orthographic projection, and taking up the study of isometric, oblique, axiometric and other systems of pictorial drawing with reference to their use in the sketching of machine parts. Text: "Engineering Drawing" by French. Mr. Laton.

Required of Freshmen in Architectural, Electrical, Mechanical and Industrial courses. 2 credits: 2 drawing periods.

2-c. Machine Drawing. A continuation of 1.5-b, with the study of various types of fastenings (bolts, screws, rivets, etc.) and drafting room methods as applied to commercial practice; tracing and blueprinting. Mr. Laton.

Prerequisite: Drawing 1.5-b. Required of Freshmen in Architectural, Electrical, Mechanical and Industrial courses. 2 credits: 2 drawing periods.

3-a. Machine Drawing. A continuation of 2-c, including the representation of machine and structural parts. Drawings are made from sketches and from the original machines, with individual problems in commercial machine drawing to conform to specified requirements. Mr. Laton.

Prerequisite: Drawing 2-c. Required of Sophomores in Architectural, Electrical, Mechanical and Industrial courses. 2 credits: 2 drawing periods.

4-b, 4.5-c. Descriptive Geometry. An application of the principles of descriptive geometry to the solution of problems in points, lines, planes and solids. Mr. Laton.

Prerequisite: Drawing 3-a. Required of Sophomores in Architectural, Electrical, Mechanical and Industrial courses. 2 credits: 2 drawing periods.

5-a. Mechanical Drawing. A study of the fundamentals of mechanical drawing, including free-hand lettering, the use of drawing instruments, and a brief study of orthographic and isometric projection. Mr. Laton.

Required of Freshmen in Chemical Engineering. 2 credits: 2 drawing periods.

10-c. Agricultural Drawing. Instruction in this subject includes drafting room exercises in free-hand lettering; the use of drawing instruments; a brief study of orthographic and isometric projection; together with the drawing of plans and elevations of simple farm structures. Mr. Shramm.

Required of Sophomores in Agriculture. 2 credits: 2 drawing periods.

20-a. Home Economics Drawing. Instruction is given in free-hand lettering, the use of drawing instruments, and the rudiments of orthographic and isometric projection drawing. This is followed by drafting room exercises in architectural representation as a preparation for

further study in house planning. Text used: "Domestic Architecture" by Robinson. Mr. Huddleston.

Required of Sophomores in Home Economics. 2 credits: 2 drawing periods.

21-b. House Planning. Lectures and recitations devoted to a brief study of the history of domestic architecture; the relation of the house plan to home making and to the individual family; its relation to the individual site, to the garden, to accessory buildings, and to the community; supplemented by drafting room exercises devoted to an analytical study of house plans. Mr. Huddleston.

Prerequisite: Drawing 20-a. Required of Sophomores in Home Economics. 2 credits: 1 lecture; 1 drawing period.

22-c. House Structure. A continuation of Drawing 21-b, taking up the study of an individual building problem, making working drawings for a small frame house designed by the student to conform to specified requirements. Professor Huddleston.

Prerequisite: Drawing 21-b. Required of Sophomores in Home Economics. 2 credits: 2 drawing periods.

23-a. Elementary Design. Studio exercises in the fundamentals of design, for the purpose of developing the student's ability to draw. Studies in pencil, pen and ink, and brush of lines, space arrangement, proportion of line and form, symmetry and balance, and their adaptation to motifs for decoration according to the laws of beauty, harmony and construction. Mr. Shramm.

Required of Freshmen in Home Economics. 2 credits: 2 drawing periods.

24-b. Costume Design. Studio exercises in pencil, pen and ink and brush devoted to an analytical study of historic ornament, flower and plant forms, and the human figure, in their application to costume design; studio methods in rendering draperies, fur, silk, velvet, lace and other textiles. Mr. Shramm.

Prerequisite: Drawing 23-a. Required of Freshmen in Home Economics. 2 credits: 2 drawing periods.

25-c. Decorative Design. Lectures throughout the term on color theories, harmonies, and qualities based on spectral colors, supplemented with studio work in different mediums, thereby giving practice in tinting, contrasting and harmonizing colors; stenciling, etc.; the

application of these studies to costume design and interior decoration. Professor Huddleston and Mr. Shramm.

Prerequisite: Drawing 24-b. Required of Freshmen in Home Economics. 2 credits: 1 lecture; 1 drawing period.

*30-a, b, c. **Free-hand Drawing.** Studio exercises in the elements of design, leading to construction of units, motifs, and simple forms of ornament; a study of the principles of arrangement, proportion of line and form, symmetry and balance according to the laws of beauty, harmony and construction. Mr. Shramm.

Required of Freshmen in Architectural Construction. 3 credits: 3 drawing periods.

*31-a, b, c. **Advanced Free-hand Drawing.** Studio exercises in pencil, charcoal, pen and ink, and brush from plaster casts of the human form, plant and flower form, and from nature; in short, a study in perspective, light and shadow construction as involved in architectural and commercial design. Mr. Shramm.

Prerequisite: Drawing 30. Required of Freshmen in Architectural Construction. 3 credits: 3 drawing periods.

*32-a, b, c. **Advanced Drawing Composition.** Studio work adapted to the needs and ability of the individual student, either along lines of pure design, or taking up any of the industrial or commercial phases of the subject, or a study in pencil, charcoal, and wash from the antique. Mr. Shramm.

Prerequisite: Drawing 31. Required of Freshmen in Architectural Construction. 3 credits: 3 drawing periods.

103-b, 103.5-c. **Elements of Architecture.** Drafting room exercises in the study of the classic orders of architecture, and elementary studies in composition. Mr. Huddleston.

Prerequisite: Drawing 3-a. Required of Sophomores in Architectural Construction. 2 credits: 2 drawing periods.

104-a. **Domestic Architecture.** Drafting room exercises in architectural representation, followed by an analytical study of house plans and modern methods of building construction. Mr. Huddleston.

Prerequisite: Drawing 102-b. Required of Juniors in Architectural Construction. 3 credits: 3 drawing periods.

* NOTE:—The object of such subject as Drawing 30 is not only to develop the utilitarian ideas involved in industrial and commercial art, but also to cultivate an appreciation and love of the beautiful in nature and art.

105-b. Domestic Architecture. A continuation of 104-a, taking up the study of an individual building problem, making working drawings for a small frame house designed by the student to conform to specified requirements. Mr. Huddleston.

Prerequisite: Drawing 104-a. Required of Juniors in Architectural Construction. 4 credits: 1 lecture; 3 drawing periods.

106-c. Domestic Architecture. A continuation of 105-b, developing interior and exterior scale and full-size details. Mr. Huddleston.

Prerequisite: Drawing 105-b. Required of Juniors in Architectural Construction. 3 credits: 3 drawing periods.

107-b, 108-c. Building Construction. Conferences, text-book study and drafting room exercises in a comprehensive study of details of wood and masonry construction reinforced concrete and steel and their application to modern building construction. Mr. Huddleston.

Prerequisites: Drawing 4.5-c. Mechanical Engineering 103-a. Required of Juniors in Architectural Construction. 4 credits: 1 lecture; 3 drawing periods.

109-a, 110-b. Building Construction and Design. Graded problems in structural design of buildings in wood and masonry, giving special consideration to mill-construction, reinforced concrete and steel. Mr. Huddleston.

Prerequisite: Drawing 108-c. Required of Seniors in Architectural Construction. 8 credits: 8 drawing periods.

111-c. Architectural Thesis. A thesis will be required of each student, consisting of a set of original working drawings, complete in details and specifications, for a public building designed to meet certain specified conditions. This work must be done in the drafting room of the department and under the supervision of the instructor. Mr. Huddleston.

Prerequisite: Drawing 110-b. Required of Seniors in Architectural Construction. 10 credits: 10 drawing periods.

CHEMISTRY

CHARLES JAMES, *Professor*
HENRY R. KRAYBILL, *Professor of Agricultural Chemistry*
GEORGE A. PERLEY, *Associate Professor*
MELVIN M. SMITH, *Assistant Professor*
WALTER S. FROST, *Assistant Professor*
HEMAN C. FOGG, *Assistant*

1-a, 2-b, 3-c. **Inorganic Chemistry.** Lectures and recitations on general and theoretical chemistry, illustrated by experiments, charts, specimens, lantern views, etc. Solution of chemical problems will be required. Mr. James, Mr. Perley and Mr. Frost.

Required of Freshmen in Agriculture and Engineering. 3 credits: 2 lectures; 1 recitation.

4-c. **Qualitative Analysis.** Laboratory practice, with occasional lectures and recitations. The student is expected to become proficient in the separation and detection of the common acids and bases, and to keep a full set of notes. Mr. Smith.

Prerequisite: Chemistry 2-b. Required of Freshmen in Chemistry. 3 credits: 3 laboratories.

5-c. **Qualitative Analysis.** Similar to Chemistry 4-c, but modified to suit students in Agriculture. Mr. Smith.

Prerequisite: Chemistry 2-b. Required of Freshmen in Agriculture. 3 credits: 3 laboratories.

6-a, 7-b, 8-c. **Inorganic Chemistry.** Similar to Chemistry 1-a. Mr. Smith.

Required of Freshmen in Home Economics. 3 credits: 2 recitations; 1 laboratory.

9-a. **Qualitative Analysis.** A continuation of 4-c, together with more advanced work upon insoluble substances, etc. Mr. Smith.

Prerequisite: Chemistry 4-c. Required of Sophomores in Chemistry. 3 credits: 3 laboratories.

10-a. **Qualitative Analysis.** Laboratory work with occasional lectures and recitations. The work covered includes the detection of the more familiar acids and bases both in simple and complex mixtures. Mr. Smith and Mr. Fogg.

Prerequisite: Chemistry 3-c. Required of Sophomores in Chemical Engineering. 6 credits: 6 laboratories.

11–a, 12–b. Qualitative Analysis. Similar to Chemistry 4–c, but adapted to the use of Sophomores in Electrical and Mechanical Engineering. Mr. Smith and Mr. Fogg.

Prerequisite: Chemistry 2–b. 3 credits: 3 laboratories.

15–a, 16–b. Organic Chemistry. A study of the more important organic compounds from the viewpoint of the Home Economics student. Mr. Fogg.

Prerequisite: Chemistry 8–c. Required of Sophomores in Home Economics. 2 credits: 2 recitations.

17–a. Inorganic Preparations. Laboratory work upon the preparation of pure salts. Mr. Perley.

Prerequisite: Chemistry 9–a. Required of Sophomores in Chemistry. 2 credits: 2 laboratories.

18–b. Quantitative Analysis. A preliminary study of quantitative analysis to familiarize the student with the general methods of chemical manipulation and analysis. Mr. Frost.

Prerequisites: Chemistry 3–c. Required of Sophomores in Chemistry. Elective for Sophomores, Juniors and Seniors in Arts and Science, provided laboratory facilities permit. 5 credits: 5 laboratories.

19–c. Quantitative Analysis. A continuation of 18–b.

Prerequisite: 18–b. Required of Sophomores in Chemistry. Elective for Sophomores, Juniors and Seniors in Arts and Science, provided laboratory facilities permit. 7 credits: 7 laboratories.

20–a. Organic Chemistry. Lectures and recitations. A study of the chemistry of the carbon compounds. Mr. James.

Prerequisite: Chemistry 3–c. Required of Sophomores in Chemistry. Elective for Arts and Science students. 2 credits: 2 lectures.

21–b, 22–c. Organic Chemistry. A continuation of 20–a.

Prerequisite: Chemistry 20–a. Required of Sophomores in Chemistry. Elective for Arts and Science students. 3 credits: 3 lectures.

23–a. Household Chemistry. This subject treats of the chemistry of foods, beverages, baking chemicals, preservatives and detergents. Mr. Perley.

Prerequisite: Chemistry 8–c. Required of Juniors in Home Economics. 3 credits: 1 lecture; 2 laboratories.

***24–a, c. Organic Chemistry Laboratory.** The work in this subject consists mainly of laboratory practice in preparing and purifying organic compounds. Lectures and recitations will be held from time to time in connection with the practice. Mr. Perley.

Prerequisite: Chemistry 22–c. Required of Juniors in Chemistry. Elective for Arts and Science students. 2 credits: 2 laboratories.

25–b. Organic Chemistry Laboratory. A continuation of Chemistry 24–a. Mr. Perley.

Prerequisite: Chemistry 22–c. Required of Juniors in Chemistry. Elective for Arts and Science students. 2 credits: 2 laboratories.

26–a. Advanced Quantitative Analysis. Mr. Frost.

Prerequisite: Chemistry 19–c. Required of students in Chemistry. Elective for Arts and Science students. 4 credits: 4 laboratories.

27–b. Advanced Quantitative Analysis. A continuation of 26–a. Mr. Frost.

Prerequisite: Chemistry 26–a. Required of students in Chemistry. Elective for Arts and Science students. 4 credits: 4 laboratories, for Arts students: 5 credits: 5 laboratories, for Chemical Engineers.

28–c. Advanced Quantitative Analysis. A continuation of 27–b. Mr. Frost.

Prerequisite: Chemistry 27–b. Required of students in Chemistry. Elective for Arts and Science students. 4 credits: 4 laboratories.

29–a, 30–b, 31–c. Physical Chemistry. Advanced study of chemical theory. Practical experiments will be performed in the determination of vapor density, molecular weights, specific heat, etc.; and the study of isomorphism, diffusion of gases, solutions, ionization, electrol-

*Given as 24–c for students in the Arts Course in Chemistry.

ysis, molecular and atomic volume, thermo chemistry, equilibrium, the phase rule, etc., will take up much of the time. Mr. Perley.

Prerequisite: Chemistry 3–c. Required of Juniors in Chemistry. Elective for Arts and Science students. 3 credits: 3 lectures.

32–a, 33–b, 34–c. Advanced Inorganic Chemistry. Mr. James.

Prerequisite: Chemistry 3–c. Required of Seniors in the Arts and Science course in Chemistry. Elective for Students in Chemical Engineering. 3 credits: 3 lectures.

35–a, 36–b, 37–c. Industrial Chemistry. Mr. Perley.

Prerequisite: Chemistry 3–c. Required of students in Chemical Engineering. Elective for students in the Arts and Science course in Chemistry. 3 credits: 3 lectures.

38–a. Advanced Quantitative Laboratory. Gas analysis, etc. Mr. Frost.

Prerequisite: Chemistry 28–c. Required of Seniors in Chemical Engineering. 4 credits: 4 laboratories.

39–a. Thesis. The time is devoted to some selected subject, and the student is required to present a thesis showing him to be a careful manipulator and a person of independent thought. Mr. James.

For Seniors in Chemistry who have completed all quantitative analysis. Elective for Arts and Science Seniors. 5 credits: 5 laboratories, for Arts and Science students; 4 credits: 4 laboratories, for Chemical Engineers.

40–b. Thesis. Similar to Chemistry 39–a. Mr. James.

Required of students in Chemical Engineering and students in Arts and Science course in Chemistry. 5 credits: 5 laboratories, for Arts and Science students. 6 credits: 6 laboratories, for Chemical Engineers.

41–c. Thesis. A continuation of 40–b. Mr. James.

Required of students in Chemical Engineering and students in Arts and Science course in Chemistry. 5 credits: 5 laboratories, for Arts and Science students. 6 credits: 6 laboratories, for Chemical Engineers.

42–a. Physical Chemical Laboratory. Mr. Perley.

Prerequisite: Chemistry 31–c. Required of students in Chemical Engineering. Elective for Arts and Science students. 2 credits: 2 laboratories.

43-a. Agricultural Chemistry. A study of the chemistry of the carbon compounds with particular emphasis upon those (carbohydrates, proteins, and fats) of most importance in agriculture. Mr. Kraybill.

Prerequisites: Chemistry 3-c and 5-c. Required of Sophomores in Agriculture. 2 credits: 1 lecture, 1 recitation.

44-b. Agricultural Chemistry. The chemistry of the processes of growth and development of plants, plant compounds, crops and the factors influencing plant growth such as air, soil, fertilizers, lime, manure, etc. Mr. Kraybill.

Prerequisite: Chemistry 43-a. Required of Sophomores in Agriculture. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

45-c. Agricultural Chemistry. A continuation of 44-b including the chemistry of animal physiology, foods and dairy products and an introduction to quantitative analysis. Mr. Kraybill.

Prerequisite: Chemistry 44-b. Required of Sophomores in Agriculture. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

ELECTRICAL ENGINEERING

L. W. Hitchcock, *Associate Professor (Acting Head of Department)*
A. D. Wassall, *Instructor*

1-a, 2-b, 3-c. Dynamo Electric Machinery. This subject includes a general study of electric and magnetic quantities, direct current circuits, magnetic circuits, direct current generators and motors, primary and secondary cells and batteries, electrolysis, electroplating, electrotyping, elements of photometry and electric illumination, electrical measuring instruments, inductance; capacity; alternating current circuits, the use of complex quantities, power factor, wave form, alternators and armature windings. A large number of problems are solved. One exercise a week is devoted to laboratory experiments illustrating the practical application of the theory.

Prerequisites: Physics 8-c and Mathematics 9-c. Required of Juniors in Electrical Engineering. 4 credits: 3 recitations; 1 laboratory.

4-a. Telegraph and Telephone. A study of the acoustic and electrical principles of telephony; transmitting and receiving apparatus;

magneto and common-battery switchboards and accessories; selective party-line systems; intercommunicating systems; overhead and underground construction; phantom, simplex, and composite circuits; transpositions, etc.; the principles of telegraphy, sounders, repeaters, etc.; wireless telegraphy and telephony; electric signalling for purposes of alarm, etc.

Prerequisites: Electrical Engineering 3-c, 17-c, or 102-c. Elective for Seniors in Engineering and Industrial courses. 2 credits: 2 recitations.

5-c. Application of Electricity to Agriculture. Arranged for and adapted to students in agriculture. The subject consists of a general study of electric circuits; generators, motors and storage batteries, their care and operation; simple problems in transmission; methods of wiring for electric light and power including a study of the National Electrical Code Rules; electric bell wiring and signalling apparatus; the telephone, the general principles upon which it operates and the different systems of installation; etc.

Elective for Seniors in Agriculture. 3 credits: 2 recitations; 1 laboratory.

7-a, 8-b. Electrical Engineering Practice. This subject includes a detailed study of alternators, transformers, induction motors, regulators, synchronous motors, converters and rectifiers.

Prerequisite: Electrical Engineering 3-c. Required of Seniors in Electrical Engineering. 3 credits: 3 recitations.

9-c. Transmission and Distribution Systems. A study of the factors effecting the design, construction and operation of transmission lines and distribution circuits. This includes the electrical, mechanical and economic calculations involved; lightning protection methods and apparatus; etc. A study of existing installations will be made.

Prerequisite: Electrical Engineering 8-b. Required of Seniors in Electrical Engineering. 3 credits: 3 recitations.

10-b. Electric Railways. The practicability of construction from an economic standpoint; determination of the size, type, and seating capacity of cars; track location and construction; train schedules; methods of control; train resistance; speed-time and current-time curves; selection of motors; the feeder system; electrolysis; power

station and sub-station location; storage batteries; signal systems; electric track switches, etc. Illustrated by problems.

Required of Seniors in Electrical Engineering. 3 credits: 3 recitations.

11-a, 12-b, 13-c. **Electrical Laboratory.** This subject includes the operation and testing of direct and alternating current motors and generators, transformers, rotary converters, rectifiers, etc. A written report on each experiment or test is required.

Prerequisite: Electrical Engineering 3-c. Required of Seniors in Electrical Engineering. 3 credits: 2 laboratories.

14-c. **Thesis.** An investigation conducted along lines in which the student is interested. A deposit of fifteen dollars to cover damage to instruments, apparatus, etc., is required; the unexpended balance is refunded at the close of the college year. Apparatus constructed as a part of a thesis shall remain the property of the department. Credits in this subject may be arranged to include credits in other required subjects for this term depending upon the nature of the thesis.

Permission to elect subject optional with head of department. Open only to Seniors in Electrical Engineering. 1–8 credits.

15-a, 16-b, 17-c. **Industrial Electricity.** This subject consists of a study of the electric circuit, the magnetic circuit; direct current generators and motors; elementary electrochemistry covering storage batteries, refining of metals, electrotyping, and electroplating; photometry; electrical measuring instruments; inductance; capacity; the alternating current circuit; alternating current generators, motors, starting devices, controllers, transformers, converters and rectifiers.

Required of Seniors in Chemical Engineering, and Juniors in Mechanical Engineering. 3 credits: 2 recitations; 1 laboratory.

18-c. **Design of Electrical Machinery.** A study of the design of the more important electrical machines, including the calculation of the dimensions of the machine, both electrical and mechanical, and the predetermination of its performance from the dimensions.

Prerequisite: Electrical Engineering 8-b. Required of Seniors in Electrical Engineering. 3 credits: 1 recitation; 2 laboratories.

19-b. Illumination Engineering. A study of the National Electrical Code Rules for electrical wiring and apparatus; arc and incandescent lamps; the principles of photometry and illumination; shades and reflectors; residence, office, store and factory lighting; street lighting; flood lighting; electric signs; illumination calculations; rates; etc.

Prerequisite: Electrical Engineering 3-c. Elective for Seniors in Electrical Engineering. 2 credits: 2 recitations.

21-c. Electrical Problems. The solution of a large number of problems involving both direct current and alternating current circuits and machinery.

Prerequisite: Electrical Engineering 8-b. Elective for Seniors in Electrical Engineering. 2 credits: 2 recitations.

22-a. Electrical Laboratory. Operation and testing of direct and alternating current generators and motors, starting devices, transformers, converters, rectifiers, etc.

Prerequisite: Electrical Engineering 3-c. Required of Seniors in Mechanical Engineering. Given in 1920–1921 only. 2 credits: 1 laboratory.

23-c. Abstracts. Reports by students on assigned articles of engineering interest.

Prerequisite: Electrical Engineering 8-b. Elective for Seniors in Electrical Engineering. 1 credit: 1 recitation.

100-a, 101-b, 102-c. Elements of Electricity. A study is made of the following subjects: the calculation of wire sizes for circuits; the wiring of buildings for lighting, power, and other domestic purposes; the requirements of the National Board of Fire Underwriters in connection with electrical installations; direct current dynamos and motors; batteries; signalling apparatus, bells, gas ignition, electrical measuring instruments; inductance and capacity and their effects in alternating current circuits; impedance; power and power factor; current and voltage relations in series and parallel circuits; single phase, two phase, and three phase systems, etc.

Required of Juniors in the Industrial Course. 100-a is required of Seniors in Architectural Construction. 3 credits: 2 recitations; 1 laboratory.

103-a. Electrical Machinery. The subjects 103-a and 104-b include a study of single phase and polyphase alternators; the parallel operation

of alternators; synchronous motors; induction motors; starters, compensators, and controllers for alternating current motors; transformers for single phase and polyphase circuits; converters and rectifiers.

Prerequisite: Electrical Engineering 102-c. Required of Seniors in the Industrial Course. 3 credits: 3 recitations.

104-b. Electrical Machinery. Continuation of 103-a.

Prerequisite: Electrical Engineering 103-a. Required of Seniors in the Industrial Course. 2 credits: 2 recitations.

105-a, 106-b, 107-c. Electrical Laboratory. The study, operation and test of alternating current generators, synchronous motors, induction motors, transformers, converters, etc.

Prerequisite: Electrical Engineering 102-c. Required of Seniors in the Industrial Course. 2 credits: 2 laboratories.

MATHEMATICS

HERMON L. SLOBIN, *Professor*
CARL A. GARABEDIAN, *Assistant Professor*
HAINES B. QUIMBY, *Instructor*
MAURICE E. GELINAS, *Instructor*
KARL L. WILDES, *Teaching Fellow*

1-a. Trigonometry. The general angle; trigonometric functions of the general angle; radian measure; solution of right and oblique triangles with and without logarithms; trigonometric identities and equations; inverse trigonometric functions.

Mathematics 2-a required as a parallel subject. Required of Freshmen in Engineering, and in Arts and Science Chemistry. 3 credits: 3 recitations.

2-a, 3-b. Algebra. Review of fundamental operations; theory and use of logarithms; graphs of simple algebraic functions; variations, complex numbers; elements of determinants and theory of equations; special problems in solid geometry for algebraic solution.

Required of Freshmen in Engineering, and in Arts and Science Chemistry. 3 credits: 3 recitations.

4-b. Analytic Geometry. Cartesian and polar co-ordinates; graphs of algebraic functions; change of co-ordinate axes; graphs of transcendental functions; straight line; circle; conics.

Prerequisites: Mathematics 1-a and 2-a; Mathematics 3-b required as a parallel subject. Required of Freshmen in Engineering, and in Arts and Science Chemistry. 3 credits: 3 recitations.

5-c. Analytic Geometry. A continuation of 4-b. Empirical equations; higher plane curves; analytic geometry of space.

Prerequisites: Mathematics 3-b and 4-b; Mathematics 6-c required as a parallel subject. Required of Freshmen in Engineering, and in Arts and Science Chemistry. 3 credits: 3 recitations.

6-c. Calculus. Differentiation and integration of the standard elementary forms, with simple applications.

Prerequisites: Mathematics 3-b and 4-b; Mathematics 5-c required as a parallel subject. Required of Freshmen in Engineering, and in Arts and Science Chemistry. 3 credits: 3 recitations.

7-a, 8-b, 9-c. Calculus. A continuation of 6-c. More advanced applications of differentiation and integration; special methods of integration; the definite integral; applications of the definite integral to geometry, physics and mechanics.

Prerequisite: Mathematics 6-c. Required of Sophomores in Engineering. 7-a required in Arts and Science Chemistry. 3 credits: 3 recitations.

10-a, 11-b, 12-c. Advanced Calculus. A study of some of the more advanced topics of differential and integral calculus and of ordinary differential equations, especially those of the first and second orders, with applications of geometry, physics and mechanics. Mr. Slobin.

Prerequisite: Mathematics 9-c. 3 credits: 3 recitations.

13-a. Teaching of Mathematics in Secondary Schools. Lectures and reports on assigned readings. Particular attention given to the teaching of first-year algebra and plane geometry. A term paper on some assigned topic will be required. Mr. Slobin.

Prerequisites: Mathematics 6-c and Education 1-a and 2-b. Required of Arts and Science students whose major is mathematics. 3 credits: 3 recitations.

14-b, 15-c. Theory of Equations and Determinants. Definitions and properties of determinants; complex numbers; properties of polynomials and equations; solution of numerical equations; elimination. Mr. Slobin.

Prerequisite: Mathematics 9-c. 3 credits: 3 recitations.

16-a, 17-b, 18-c. Advanced Analytic Geometry. More advanced work than that covered in Mathematics 5-c. Mr. Slobin.

Prerequisite: Mathematics 9-c. 3 credits: 3 recitations.

19-a, 20-c. Surveying. Theory, use and adjustment of the chain, level, transit and plane table. The field work consists of measuring distances, angles and areas; establishing bench marks, running profiles, grade lines and cross-sections with the level; finding areas with the transit; laying out simple curves with the transit; and making topographic maps with the plane table and transit.

Prerequisites: Mathematics 9-c and Drawing 3-c. Required of Seniors in Mechanical and Electrical Engineering. 3 credits: 3 laboratories.

21-b, c. The Elements of Plane Trigonometry.

21-b required of Freshmen in Agriculture; 21-c required of Freshmen in Architectural Construction and Industrial courses. 3 credits: 3 recitations.

22-a, 23-c. Surveying. Theory and use of the chain, level, transit, and plane table. The field work consists of measuring distances, angles and areas; establishing bench marks, running profiles, grade lines and cross-sections with the level; finding areas with the transit; the making of topographic maps with the plane table and transit.

Prerequisite: Mathematics 1-a or 21. Required of Seniors in Agriculture (Horticulture and Forestry), Architectural Construction and Industrial courses. 3 credits: 3 laboratories.

101-a. Algebra. Review of fundamental operations including quadratics; theory and use of logarithms; graphs of simple algebraic curves.

Required of Freshmen in Architectural Construction and Industrial courses. 3 credits: 3 recitations.

102-a, 104-b, 106-c. Shop Mathematics. Applications of algebra and geometry to shop problems.

Prerequisite: Mathematics 101-a required as a parallel subject to 102-a. Mathematics 21-c required and parallel subject to Mathematics 106-c. Required of Freshmen in the Industrial Course. 102–a required of Sophomores in Architectural Construction. 3 credits: 3 recitations.

103-b. Solid Geometry. The elements of solid geometry.

Required of Freshmen in Architectural Construction and Industrial courses. (Credit will not be given for completion of this subject when Solid Geometry has been offered for admission.) 3 credits: 3 recitations.

MECHANICAL ENGINEERING

CALVIN H. CROUCH, *Professor*
EDWARD L. GETCHELL, *Assistant Professor*

1-b. Kinematics of Machinery. A study of motion in machine construction; instantaneous centers and their application to the analysis of the direction and velocity of motion; velocity and acceleration diagrams; design of quick return mechanisms; study of tooth gearing; design of cams; and the study of trains of gearing. Mr. Getchell.

Prerequisite: Drawing 4-a. Required of Sophomores in Electrical and Mechanical Engineering. 3 credits: 1 recitation; 2 laboratories.

2-c. Mechanics. Force; equilibrium; composition and resolution of forces; center of gravity; couples; non-current forces; stresses in cranes and framed structures; moment of inertia of areas and solids; motion of translation and rotation. Mr. Crouch.

Prerequisite: Mathematics 8-b. Required of Sophomores in Electrical and Mechanical Engineering. 3 credits: 3 recitations.

3-a, 4-b, 4.5-c. Mechanics. A continuation of M. E. 2-c, and includes dynamics, work, energy and power, strength of materials, a study of the stresses and strains in riveted joints, beams and columns, and deals with graphical statics, roof trusses and reinforced concrete.

Prerequisite: Mechanical Engineering 2-c. Required of Juniors in Electrical and Mechanical Engineering. 3 credits: 3 recitations.

5-a, 6-b, 7-c. Mechanical Laboratory. This consists of efficiency tests of simple machines; calibration of instruments used in laboratory practice; tension, transverse, and compression tests of steel, iron and wood; cement and concrete testing; testing of lubricants, valve setting, steam colorimetry, flue gas analysis; steam engine indicator practice and friction tests of steam engines.

Prerequisite: Mechanical Engineering 2-c. Required of Juniors in Electrical and Mechanical Engineering. 2 credits: 1 laboratory.

8-a. Materials of Construction. Manufacture of iron and steel, brasses, and white metal alloys; heat treatment of steel; manufacture of cement; production of cast iron and cast steel, together with the

proper arrangement of foundry and equipment; machinery for and arrangement of smithy; drop forging; wire drawing, etc.

Required of Juniors in Electrical and Mechanical Engineering; Seniors in Chemical Engineering, and in Architectural Construction and Industrial courses. 3 credits: 3 recitations.

9-a, 10-b. Machine Design. A study of friction, lubrication, belt, rope and chain transmission; analysis of the stresses and strains in machine members; and the design of a boiler. It also includes the design of some machine such as a steam engine. Mr. Getchell.

Prerequisite: Mechanical Engineering 2-c. Required of Juniors in Electrical and Mechanical Engineering. 3 credits: 1 recitation; 2 laboratories.

11-c. Valve Gears and Boiler Design. The Bilgram and Zuener valve diagrams and their application to the design of slide valves and Corliss valves. The study of various types of valve gears and governors. The design of a return tubular boiler.

Prerequisite: Mechanical Engineering 9-a. Required of Juniors in Electrical and Mechanical Engineering. 3 credits: 1 recitation; 2 laboratories.

12-b, 13-c. Hydraulics. The mechanics of liquids; pressure on submerged areas such as gates, dams, etc., measurement of the flow of water through weirs, nozzles, orifices, and the flow of water in pipes, channels, and streams; the application of the principles of hydraulics to water motors such as turbines, overshot and undershot wheels, Pelton wheels, etc.; also the consideration of the various types of rotary pumps. Mr. Getchell.

Prerequisite: Mechanical Engineering 4-b. Required of Seniors in Mechanical and Electrical Engineering. 3 credits: 3 recitations.

14-b, 15-c. Thermodynamics. A study of the principles of thermodynamics and the thermodynamic properties of steam, vapors and gases; the efficiencies of the various steam and gas engine cycles. A study of the different types of steam and gas engines, steam turbines, air compressors, refrigerating machines and condensers. It also includes a study of fuel combustion in furnaces and the producer gas generator. Mr. Crouch.

Prerequisite: Mathematics 8-b. Required of Juniors in Electrical and Mechanical Engineering, and Seniors in Chemical Engineering. 3 credits: 3 recitations.

16-a. Power Plant Engineering. Fuels and combustion and the losses due to incomplete combustion; boilers of various types; furnaces and stokers; methods of handling coal and ash; design of stacks; and a study of the different types of reciprocating engines. Mr. Crouch.

Prerequisite: Mechanical Engineering 15-c. Required of Seniors in Mechanical and Electrical Engineering. 3 credits: 3 recitations.

17-b. Power Plant Engineering. A continuation of 16-a. The study of the various types of steam turbines, condensers, feed water purifiers and heaters, pumps and other auxiliary equipment of the steam power plant. Mr. Crouch.

Prerequisite: Mechanical Engineering 16-a. Required of Seniors in Mechanical and Electrical Engineering. 3 credits: 1 recitation; 2 laboratories.

18-a, 19-b, 20-c. Mechanical Laboratory. Fuel analysis; gas and steam engine tests; tests of different types of injectors; pump tests, and boiler tests; and special work of an advanced nature in testing machines and original work to be carried out under the direction of the instructor.

Prerequisite: Mechanical Engineering 15-c. Required of Seniors in Mechanical and Electrical Engineering. 2 credits: 1 laboratory.

21-b. Heating and Ventilating. A study of the heat losses of buildings, and the design of heating and ventilating systems for residences, factories, etc. Mr. Crouch.

Required of Seniors in Mechanical Engineering and Architectural Construction. 3 credits: 1 recitation; 2 laboratories.

23-b, 24-c. Machine Design. Advanced work in machine design, and includes an analysis of stresses in machine members, and the proper proportioning of the machine parts and the design of the same so they can be most cheaply produced in the various shops, power plant design, etc.

Prerequisite: Machine Design 11-c. Required of Seniors in Mechanical Engineering. 3 credits: 1 recitation; 2 laboratories.

25-a. Industrial Engineering. A study of factory conditions, safety devices, sanitation, lighting, various methods of remunerating labor,

and a study of various forms of scientific management as applied to factory supervision.

Elective for Seniors in Mechanical Engineering. 3 credits: 3 recitations.

28-a. **Water Supplies and Purification.** This consists of a study of the methods employed to purify drinking waters and the treatment of sewage.

Elective for Seniors in Mechanical and Electrical Engineering, Architectural Construction and Industrial courses. 2 credits: 2 recitations.

30-c. **Thesis.** Original research work under the direction of the head of the department. Mr. Crouch.

Open only to Seniors in Mechanical Engineering. 3 to 6 credits.

101-b, 102-c. **Elements of Mechanics.** Principles of mechanics as applied to engineering structures involving composition of forces, analysis of stresses, concurrent forces, graphics, motion of translation and rotation, dynamics as applied to flywheels and rotating bodies, strength of materials, beams, columns, etc. Graphical solution of forces in roof trusses and other framed structures. Mr. Getchell.

Required of Sophomores in Architectural Construction and Industrial courses. 3 credits: 3 recitations.

103-a. **Elements of Mechanics.** A continuation of M. E. 102-c. Mr. Getchell.

Prerequisite: Mechanical Engineering 102-c. Required of Juniors in Architectural Construction and Industrial courses. 3 credits: 3 recitations.

104-a. **Boiler Design and Graphics.** A study of the graphical solution of forces acting on roof trusses and other framed structures, and the complete design of a return tubular boiler. Mr. Getchell.

Prerequisite: Mechanical Engineering 102-c. Elective for Juniors in the Industrial Course. 3 credits: 3 laboratories.

105-b, 106-c. **Power Plant Machinery.** A study of the steam engine and turbine, the gas engine, boilers, condensers, pumps, and other power plant auxiliary apparatus such as feed water heaters, economizers, etc.; also a study of fuel, combustion, mechanical stokers and boiler furnaces. Mr. Getchell.

Elective for Juniors in the Industrial Course. 3 credits: 3 recitations.

107-a, 108-b, 109-c. **Mechanical Laboratory.** Testing of materials used in construction, calibration of instruments used in the laboratory. Steam engine indicator practice, steam calorimetry, etc.

Prerequisite: Mechanical Engineering 102-c. Required of Juniors in Architectural Construction and Industrial courses. 2 credits: 1 laboratory.

110-a. **Machine Design.** The application of the principles of mechanics to the design of some machine.

Prerequisite: Students must have had or must take with this subject M. E. 103-a, 105-b, 106-c. Required of Juniors in the Industrial Course. 2 credits: 2 laboratories.

114-a, 115-b, 116-c. **Mechanical Laboratory.** Advanced work in engine testing, boiler and economy tests of power plants.

Prerequisite: Mechanical Engineering 109-c. Required of Seniors in the Industrial Course. 2 credits: 1 laboratory.

117-b. **Power Plant Design.** The design of a complete power plant for a factory. This will include the choice of the proper boilers, engines or turbines, and auxiliary apparatus, and the most efficient layout for the equipment chosen. Mr. Getchell.

Elective for Seniors in the Industrial Course. 3 credits: 2 recitations; 1 laboratory.

118-c. **Power Plant Design.** A continuation of 117-b. The work includes the layout of the machinery of a factory with special reference to the most efficient routing of the products through the building. Mr. Getchell.

Prerequisite: Mechanical Engineering 117-b. Elective for Seniors in the Industrial Course. 3 credits: 1 recitation; 2 laboratories.

MINERALOGY

CHARLES JAMES, *Professor*
MELVIN M. SMITH, *Instructor*

1-b. **Mineralogy.** A brief study of blowpipe analysis, followed by laboratory practice in the determination and study of minerals, with special reference to their economic value. Mr. Smith.

Prerequisite: Chemistry 3-c. Required of students in Chemical Engineering. 3 credits: 3 laboratories.

PHYSICS

HORACE L. HOWES, *Professor*
CLEMENT MORAN, *Assistant Professor*
OTIS W. PIKE, *Student Assistant*

1-a, 2-b, 3-c. Introductory Physics. The properties of matter, mechanics, heat, magnetism, electricity, wave-motion, sound and light. The course consists of experimental lectures and recitations. A note book written by the student in the lectures is examined frequently. Certain references to Kimball's College Physics are required. Mr. Howes.

Required of all Sophomores in the Industrial Course and Freshmen women in Home Economics. Required of all Sophomores in the Agricultural Course in the first two terms. Elective for Arts and Science students. 3 credits: 2 lectures, 1 recitation.

6-a, 7-b, 8-c. General Physics. Mechanics and properties of matter the first term, followed by heat, sound and light the second term and magnetism and electricity the last term. One experimental lecture with problems from Masius' Problems in General Physics for College Courses. Recitations based on Duff's Text-book of Physics. Mr. Howes and Mr. Moran.

Prerequisite: Mathematics 12-c. Required of Sophomores in Electrical and Mechanical Engineering and of Juniors in Chemical Engineering. Elective for Arts and Science students who have passed Mathematics 9-c, and who are taking or have passed advanced Calculus. 3 credits: 1 lecture, 2 recitations.

9-a. General Physics Laboratory. A course in laboratory to supplement the theory in Physics 6-a. The first term will be devoted to mechanics with separate reports and problems required for each experiment. The development of laboratory technique and of the ability to appreciate the relative magnitudes of the sources of error in an experiment is impressed. Mr. Moran, Mr. Howes and Mr. Pike.

Prerequisite: Physics 6-a must precede or accompany this course. Required of Sophomores in Electrical and Mechanical Engineering and of Juniors in Chemical Engineering. Elective for Arts and Science students. 3 credits: 2 laboratories.

10-b. General Physics Laboratory. A continuation of 9-a, to include experiments in heat, sound and light. Mr. Moran, Mr. Howes, Mr. Pike.

Prerequisite: Physics 7-b must precede or accompany this course. Required of Sophomores in Electrical and Mechanical Engineering and of Juniors in Chemical Engineering. 3 credits: 2 laboratories.

11-c. General Physics Laboratory. A continuation of 10-b, to include experiments in magnetism and electricity. Mr. Moran, Mr. Howes, Mr. Pike.

Prerequisite: Physics 8-c must precede or accompany this course. 3 credits: 2 laboratories.

12-a. Household Physics. A course in applied physics for those students in Home Economics who have had a general course in the fundamental principles of physics. Mr. Moran.

Prerequisite: Physics 3-c, or the equivalent. 3 credits: 2 lectures; 1 laboratory. (Not open to Freshmen women.)

13-c. Elementary Optics and Photography. Lectures on the fundamental principles of geometrical optics and photographic instruments. A part of the laboratory will consist of the taking and finishing of photographs. Students will furnish their own cameras and supplies. Mr. Moran.

Prerequisite: Physics 2-b, or the equivalent. Open to Sophomores, Juniors and Seniors. 3 credits: 2 recitations; 1 laboratory.

SHOPS

Calvin H. Crouch, *Head of Department*
Lyman J. Batchelder, *Instructor*
W. W. Finley, *Instructor*

1-a. Wood Work. Instruction in the use and care of wood-working tools and machinery, saw filing, the steel square and its uses, plain pattern making, plain cabinet making and plain construction. Mr. Batchelder.

Required of Freshmen in Engineering, Architectural Construction and Industrial courses. 2 credits: 2 laboratories.

2-b, 3-c. Wood Work. A continuation of 1-a. Plain cabinet work and advanced pattern making. Mr. Batchelder.

Required of all Freshmen in Architectural Construction and Industrial courses. 2 credits: 2 laboratories.

4-b. Forging. This is a study of the forging of iron and steel and is designed to teach the operations of drawing, upsetting, welding, twisting, splitting, and punching of iron; the hardening, tempering, and annealing of cast steel; and the case hardening of mild steel as adapted to agricultural work.

Required of Juniors in Agriculture. 3 credits: 3 laboratories.

5-c. Forging. This is a study of the operations necessary in the forging of iron and steel and is designed to teach the methods of drawing, upsetting, welding, twisting, splitting, and punching of iron; also the hardening, tempering, and annealing of cast steel, and the case hardening of mild steel as adapted to engineering work.

Required of Freshmen in Mechanical and Electrical Engineering. 2 credits: 2 laboratories.

6-a, 7-b, 8-c. Machine Work. Exercises in bench work, chipping, filing, and scraping, and the laying out of work from drawings. A study of cutting edges and tool adjustments, together with a study of the cutting speeds and feeds on lathes, drill presses, etc. Practice in operating the drill press, and simple lathe work. Mr. Finley.

Required of Sophomores in Mechanical and Electrical Engineering. 2 credits: 2 laboratories.

19-c. Wood Shop. Instruction in the care and use of tools in farm carpenter shop; saw filing; the making of various implements used on the farm; farm carpentry; use of steel square; laying out framing; care of lumber on the farm. Mr. Batchelder.

Required of Juniors in Agriculture. 2 credits: 2 laboratories.

22-c. Machine Work. An elementary study of the operation of the principal machines suited to the chemist's needs. Mr. Finley.

Required of Seniors in Chemical Engineering. 3 credits: 3 laboratories.

26-a. Practice Teaching. Exercises, under supervision of the instructor, in teaching manual training in wood shop. Mr. Batchelder.

Elective for Seniors in the Industrial Course. 2 credits: 2 laboratories.

29-c. Wood Work. Advanced pattern making, involving split and loose piece patterns, core boxes, dry sand moulding, etc. Mr. Batchelder.

Elective for Seniors in Mechanical and Electrical Engineering. 2 credits: 2 laboratories.

101-a. Wood Work. A continuation of 3-c; advanced pattern making, involving loose piece patterns, gated patterns, chills, dry sand mouldings, etc. Mr. Batchelder.

Prerequisite: Shop 3-c. Required of Sophomores in Architectural Construction. 2 credits: 2 laboratories.

102-b. Wood Work. Architectural and cabinet wood turning; spindle, chuck, and face plate work. Mr. Batchelder.

Required of Sophomores in Architectural Construction. 2 credits: 2 laboratories.

103-c. Wood Work. Carpentry and building; including the laying out of foundations, rafters, stair stringers, trusses and the construction of buildings. Also a study of the common woods used in buildings. Mr. Batchelder.

Required of Sophomores in Architectural Construction. 2 credits: 2 laboratories.

104-a. Forging. Forging of iron and steel, and the operations of drawing, upsetting, welding, twisting, splitting and punching of iron. Also the hardening, tempering and annealing of cast steel, and the case hardening of mild steel.

Required of Sophomores in the Industrial Course. 2 credits: 2 laboratories.

105-b, 106-c. Machine Work. Exercises in bench work, chipping, filing and scraping, and the layout of work from drawings. A study of cutting edges and tool adjustments best suited for different metals, together with a study of the cutting speeds and feeds. Practice in operating the drill press and in simple lathe work.

Required of Sophomores in the Industrial Course. 2 credits: 2 laboratories.

107-a, 108-b, 109-c. Machine Work. Advanced lathe work; also practice in the use of the milling machine, planer, shaper, and grinder, and the manufacture of some machine, using more advanced methods and special tools. Mr. Finley.

Required of Seniors in the Industrial Course. 2 credits: 2 laboratories.

ADMINISTRATION

College Opportunities and Responsibilities.—A series of six lectures intended to outline the responsibilities which men and women assume in entering upon a college course, the opportunities before them and something of methods which are designed to give them the greatest development physically, mentally and morally. These lectures will be given by President Hetzel and members of the Faculty.

Required of all Freshmen.	Men's Gymnasium.
First Lecture	7.15 P. M.—September 21
Second Lecture	4.30 P. M.—October 4
Third Lecture	4.30 P. M.—October 18
Fourth Lecture	4.30 P. M.—November 1
Fifth Lecture	4.30 P. M.—November 15
Sixth Lecture	4.30 P. M.—December 6

LIBRARY SCIENCE

WILLARD P. LEWIS, *Librarian*

1-a. **Elementary Library Science.** A general introduction to library methods with a brief survey of cataloging, classification, reference work, bibliography, book order and selection, library history and practical work.

Elective for Sophomores, Juniors and Seniors. 3 credits: 2 lectures; and two hours of practise work per week. Required lectures for Freshmen are given in connection with English 1-a, on the general use of the library.

MILITARY ARTS

Captain Chester R. Snow, *Coast Artillery Corps*
Captain Randal Kernan, *Philippine Scouts, Ret*
First Sergeant Preston E. Nutting, *Coast Artillery Corps*
Sergeant James Hayes, *Infantry*
Sergeant Patrick Hodge, *Coast Artillery Corps*
Sergeant Harold Hayes, *Coast Artillery Corps*
Corporal John Manning, *Coast Artillery Corps*

Military Training is carried on concurrently with the academic work in order that the college man may be prepared for service in time of national emergency as well as for the pursuit of his business or profession.

Two courses in Military Art are offered, one in Coast (heavy) Artillery, and one in Infantry, each leading to a commission in the Officers' Reserve Corps of the United States. Each course which covers four years is divided into the basic course covering the first two years, and the advanced course covering the succeeding two years. The basic course is required of all male freshmen and sophomores who are physically fit. The advanced course is elective for those who have completed the basic course.

Exemptions or permission to be absent cannot be accorded to freshmen or sophomores; and any student who is absent from any part of the instruction will be required subsequently to make up the omitted training or its equivalent before being credited with the number of units necessary for graduation.

The student will have the opportunity at the proper time to elect the course that he desires and having entered upon that course will be expected to continue in it while taking military training. Both courses include the fundamentals of military training, the object of which is the development of those qualities which make for success in either civil or military life, as good health and an erect carriage, courtesy and agreeable manners, enthusiasm, honor, aggressiveness, and leadership. In addition each course pays particular attention to the particular material and methods used in that arm.

The Coast Artillery course covers the principles of the construction, and the use and care of the large caliber guns used in the coast defenses,

and in the railroad and heavy artillery. The manning of these weapons requires a detailed knowledge of guns and their carriages, the forces involved in their firing, motor transportation, advanced surveying, gunnery, and artillery tactics. All heavy artillery material embodies the most advanced scientific principles and the most up to date practice in electrical, mechanical and chemical engineering. To the engineering student this course offers, in addition to military training, an excellent opportunity to observe practical applications of his class-room work and to enlarge his view of the engineering field. The War Department furnishes the necessary guns, tractors, motor vehicles and accessories to insure ample opportunity for practical work.

The Infantry course deals with all phases of the work of the infantryman, particular attention being paid to the development of the student as a leader. Practical and theoretical instruction is given in small arms firing, field engineering, tactics, and automatic arms.

The Reserve Officers Training Corps

Physically fit male students who take military training may enroll in the Reserve Officers Training Corps. Enrollments are for two years in either the basic or the advanced course. Members of the Corps are *loaned all uniforms and equipment necessary in the training. In 1919 this included:

1 U. S. Rifle, Cal. 30
1 Bayonet
1 Cartridge Belt
1 Pack Carrier
1 Haversack
1 First Aid Pouch
1 Mess Kit
1 set text books used in the Basic Course
1 Coat, wool, O. D.
1 Breeches, wool, O. D.
1 Pr. shoes, russet or marching
1 Shirt, wool, O. D.
1 Pr. Leggins,
1 Hat
1 Hat Cord
1 Belt
2 Collar ornaments.

Advanced Course.—The students who are selected for the advanced course and who agree to devote the prescribed time to this course and to attend such summer training camps as may be prescribed by the Secretary of War, are allowed during their junior and senior years, commutation of subsistence at such rate as the Secretary of War may

*A deposit of $15 is required of each student registered for Military Art. At the end of the academic year or upon a student's severing his connection with the college, this deposit will be refunded to him upon the satisfactory return to the college of all military property loaned except that a reasonable deduction will be made to cover any damage beyond natural wear and tear or for the loss of any of the equipment.

prescribe. In 1919 this was forty cents a day, amounting to about $118 for the year.

Membership in the Corps does not require the student to enter into any agreement to continue in college a definite length of time, nor does it bind him to any military service. He is as much at liberty to leave college as though he were not a member. He is required, once having entered upon the course, to complete it as a requisite toward graduation in any college maintaining a unit of the Corps, and to observe the rules and regulations prescribed for the government of the Corps.

Commissions.—Each year upon the completion of the advanced course, a certain number of students qualified for commissions in the Reserve Officers Corps will be selected by the President of the College and the Professor of Military Science and Tactics.

Members of the Officers Reserve Corps desiring further training may upon their application and upon complying with the requirements of the War Department be attached to the Regular Army for duty and training for a period not exceeding six months. Reserve officers on such duty will receive pay at the rate of $100 per month and the allowances provided by law for their grade.

Summer Camps.—The requirement of members of the advanced course to attend the summer training camps is prescribed from time to time by the Secretary of War. These camps are organized by bringing together members of the R. O. T. C. from several colleges. The training taken at the college is elaborated upon and special attention is paid to the practical side of it. The student is furnished transportation to and from the camp and is given an additional clothing allowance, so that his only expenses are for laundry and such other personal expenditures as he may care to make. Excellent food is provided. Moral conditions are carefully controlled by the regular army officers in charge. The health and hygiene of the students is under direct supervision of medical officers and medical attendance is provided for those requiring it while at camp. Athletic contests are a feature of the camp and intercollegiate athletics between members of the different units is encouraged. The student agrees to observe the rules of the camp and to give his best efforts to the course of training. Thus he is offered at no expense an exceptional opportunity for physical and mental development.

The subjects included in the basic and advanced courses change from time to time as experience indicates is best. The arrangement of the courses during 1919 is given below and it is probable that future ones will be similar.

BASIC COURSE

First year, common to all arms

1-a, 2-b, 3-c. Military Art. Military Courtesy; Infantry Drill; Ceremonies; Care and Handling of Arms and Equipment; Small Arms Firing; Personal Hygiene; First Aid and Sanitation; Interior Guard Duty; Minor Tactics; Morale.

Required of Freshmen. Practical and Theoretical. 1½ credits: 1 hour recitations; 2 hours practical.

Second Year, Infantry

4-a, 5-b, 6-c. Infantry. Continuation of first year subjects. Topography and Map Reading; Field Engineering; Orders and Messages; Signalling.

Required of Sophomores. Practical and Theoretical. 1½ credits: 1 hour recitation; 2 hours practical.

Second Year, Coast Artillery

4-a, 5-b, 6-c. Coast Artillery. Review of first year subjects. Topography and Map Reading; Signalling; Armament; Explosives; Projectiles; Primers and Fuses; Fire Control Instruments, Devices, and Charts.

Practical and Theoretical. 1½ credits: 1 hour recitation: 2 hours practical.

ADVANCED COURSE

Third Year, Infantry

7-a, -8b, 9-c. Infantry. Camp Sanitation and Care of Troops in the Field; Minor Tactics; Liaison for all Arms; Topography; Field Engineering; Law, common and military; Military Policy; Infantry Drill; Care and Handling of Arms and Equipment; Small Arms Firing; Personal Hygiene, First Aid and Sanitation; Interior Guard Duty; Orders and Messages.

Elective for Juniors. Practical and Theoretical. 3 credits: 2 recitations; 3 hours practical.

Third Year, Coast Artillery

7-a, 8-b, 9-c. Coast Artillery. Heavy Artillery Orientation; Gunnery for Field Service; Coast Artillery Drill Regulations; Camp Sanitation and Care of Troops in the Field; Minor Tactics; Liaison for all Arms; Field Engineering; Law, common and military; Military Policy.

Elective for Juniors. Practical and Theoretical. 3 credits: 2 recitations; 3 hours practical.

Fourth Year, Infantry

10-a, 11-b, 12-c. Infantry. Minor Tactics; Field Engineering; Topography; Company Administration; Military History, Policy, and Economics; Military Law; Hippology; Small Arms Firing; Personal Hygiene, First Aid, and Sanitation; Interior Guard Duty; Topography and Map Reading; Orders and Messages. Infantry Drill.

Elective for Seniors. Practical and Theoretical. 3 credits: 2 recitations; 3 hours practical.

Fourth Year, Coast Artillery

10-a, 11-b, 12-c. Coast Artillery. Exterior Ballistics; Ordnance; Organization of the Artillery; Minor Tactics; Topography; Field Engineering; Company Administration; Military Policy, History, and Economics; Military Law; Hippology.

Elective for Seniors. Practical and Theoretical. 3 credits: 2 recitations; 3 hours practical.

PHYSICAL EDUCATION

PHYSICAL EDUCATION FOR MEN

WILLIAM H. COWELL, *Head of Department and Coach Football, Basketball and Baseball*
W. F. HOWE, *Instructor Physical Education and Coach Freshman Teams*
C. R. CLEVELAND, *Coach Cross Country, Relay, and Track*

Aims.—1. To promote regulated exercise, and to provide an incentive and opportunity for every student to receive physical recreation.

2. To secure good posture, a uniform development and a reasonable amount of bodily skill and grace.

3. To stimulate the habit of exercise.

Equipment.—The gymnasium affords fine accommodation for training and indoor games.

On the first floor are the lockers and various shower baths.

On the second floor are the offices and the main gymnasium hall, which is 90 x 45.

On the third floor is the running track, the popular College Club Room containing comfortable lounging quarters, billiard and pool tables, for the use of the men students.

An athletic field adjoins the gymnasium. The field is equipped with a one-fourth mile cinder track, baseball and football field and other necessary features.

Requirements.—Unless excused by proper authority, all men students in the freshman and sophomore classes are required to complete the prescribed work in Physical Education.

Students physically unfit and students working their way through college may be excused.

A regulation gymnasium suit, the cost of which is about two dollars, must be worn.

All entering men students are examined, measured and a chart made for corrections, which affords a comparison of the student's own measurements with those of the nearly ideal, stimulating a personal interest in correcting any abnormality that may be present.

51–a. Physical Education. General setting up exercises and outdoor work. Two lectures intercollegiate football.

Required of Freshmen. ½ credit: 2 hours' work.

52–b. Physical Education. Continuation of 51–a and indoor classes. Two lectures intercollegiate basketball.

Required of Freshmen. ½ credit: 2 hours' work.

53–c. Physical Education. Elementary gymnasium exercises and field practices. Two lectures on baseball.

Required of Freshmen. ½ credit: 2 hours' work.

54–a. Physical Education. Gymnasium apparatus exercises and outdoor field games. Two lectures on intercollegiate football.

Required of Sophomores. ½ credit: 2 hours' work.

55–b. Physical Education. Indian club and dumb bell exercises, including indoor games. Two lectures on intercollegiate basketball.

Required of Sophomores. ½ credit: 2 hours' work.

56–c. Physical Education. Gymnasium and field practices. Two lectures on field games.

Required of Sophomores. ½ credit: 2 hours' work.

PHYSICAL EDUCATION FOR WOMEN

HELEN BARTLETT, *Assistant Professor*

1–a. Physical Education. Outdoor athletic games; general developing exercises; corrective gymnastics.

Required of Freshmen. 1 credit: 2 hours' work.

2–b. Physical Education. Corrective gymnastics; light gymnastics with hand apparatus; figure marching; folk dancing; games.

Required of Freshmen. 1 credit: 2 hours' work.

3–c. Physical Education. A continuation of 2–b including field athletics.

Required of Freshmen. 1 credit: 2 hours' work.

4–a. Physical Education. Outdoor athletic games; corrective gymnastics; folk dancing.

Required of Sophomores. 1 credit: 2 hours' work.

5–b. Physical Education. Corrective exercises; gymnastic marching; light gymnastics with hand apparatus; technique of aesthetic movement; simple aesthetic and character dances; elementary work on heavy apparatus.

Required of Sophomores. 1 credit: 2 hours' work.

6–c. Physical Education. A continuation of 5–b including field games and athletics.

Required of Sophomores. 1 credit: 2 hours' work.

7–a. Physical Education. Outdoor athletic games; corrective exercises.

Required of Juniors. 1 credit: 2 hours' work.

8–b. Physical Education. Swedish gymnastics; gymnastic games; advanced technique of aesthetic movement; aesthetic, national and interpretative dances; elementary work on heavy apparatus.

Required of Juniors. 1 credit: 2 hours' work.

9–c. Physical Education. A continuation of 8–b including field games and athletics.

Required of Juniors. 1 credit: 2 hours' work.

10–a. Physical Education. Outdoor athletic games.

Elective for Seniors. 1 credit: 2 hours' work.

11–b. Physical Education. Normal course in play as carried on in the school room and on the playground.

Elective for Seniors. 1 credit: 2 hours' work.

12–c. Physical Education. Field games and athletics.

Elective for Seniors. 1 credit: 2 hours' work.

13–a, 14–b. Personal Hygiene. A short study of the laws of health; the means of improving the physical and mental efficiency of the body; individual responsibility for race progress.

Required of all Freshman women. 1 credit: 1 recitation.

THE TWO-YEAR COURSE IN AGRICULTURE

FREDERICK W. TAYLOR, *Dean*

This course, established by the state legislature in 1895, provides an opportunity for those students who do not have the time, money or preparation to take a four-year college course, to secure a training for their life work.

The course is specially arranged and suited for the young, bright boys of the farm, who expect to make a business of some branch of agricultural or horticultural work. Although it is open to students who have had no previous training on the farm, the entrance of such is not encouraged because of their lack of practical experience. By independent work and close application, however, inexperienced students sometimes pass the course with credit.

The year's work closes the last week in March, so as to enable the students to get home for the spring work on the farm or to accept other positions for the summer. This short school year also permits nearly six months' time for those students who are dependent upon their own resources to earn money for the following year.

The courses of study and the classes of the two-year course are separate and distinct from those of the four-year courses. The work of the first year is largely preparatory, being a study of the sciences underlying agriculture, together with some elementary agricultural and horticultural work. The second year contains optional studies, so that it is possible for students to specialize in animal husbandry, poultry, dairy husbandry, horticulture or forestry. Ten hours a week on the average are spent in practical work on the farm, in the barn, greenhouses, shops or forest.

Admission.—The course is open to those having a fair knowledge of reading, spelling, writing, arithmetic, English grammar, geography and history of the United States. Applicants under eighteen years of age, who do not present high school or other satisfactory certificates to show their proficiency in these subjects, may be given entrance examinations on Tuesday afternoon and Wednesday morning of the opening week of college. Applicants who are over eighteen years of age will be admitted without examination.

Expenses.—The expenses of the course will vary with the taste and frugality of the students and the kind of accommodations which they

secure. The total average expense for the year, if the student holds a scholarship, is not far from $300. Many students by working for their board or room rent, or by doing various kinds of work about the college or village, are able to go through the year with a cash outlay not exceeding $150. However, as a rule, such students are either men of exceptional physical alertness, or those who are quick to seize opportunity.

Graduation.—No degree is given at the end of the course, but a certificate of graduation is issued upon its completion or the completion of its equivalent.

Students graduating from the two-year course must present to the dean of the agricultural division on or before the second Tuesday preceding their graduation satisfactory evidence of having had practical experience in farm work, either through having lived on a farm for at least two years subsequent to the age of 12, or through having worked on a farm for at least four months subsequent to the age of 15.

Students graduating from this course in 1921 must have at least 72 credit hours.

TWO-YEAR COURSE OF STUDY

First Year

	First Term ("A")	Second Term ("B")
Grammar and El. Composition (Eng. 201–a, 202–b)	3	3
Elements of Botany (Bot. 201–a)	3	
Fungus Diseases of Plants (Bot. 202–b)		2
Chemistry (Chem. 201–a, 202–b)	3	3
Farm Dairying (D. H. 201–a)	3	
Fruit Growing (Hort. 201–a)	3	
Physiology and Hygiene (Zoöl. 201–a)	3	
Types and Breeds (A. H. 201–b)		4
Agricultural Drawing (Draw. 201–b)		2
Forge (Shop 202–b)		1
Wood Work (Shop 201–b)		2
Military Art (M. A. 1–a, 2–b)	1½	1½
Physical Education (P. E. 51–a, 52–b)	½	½
	20	19

Second Year

Farm Equipment (Agron. 201–a)	3	
Soils (Agron. 203–b)		3
Field Crops (Agron. 202–a)	3	
Manures and Fertilizers (Agron. 204–b)		3
Farm Forestry (For. 201–a)	3	
Feeds and Feeding (A. H. 202–b)		3
Farm Poultry (P. H. 201–a)	3	
Economic Entomology (Ent. 201–b)		3
Military Art (M. A. 4–a, 5–b)	1½	1½
Physical Education (P. E. 54–a, 55–b)	½	½
Electives from subjects listed below	4	4
	18	18

Anatomy of Farm Animals (A. H. 203–a)	3	
Milk Production (D. H. 202–a)	3	
Buttermaking (D. H. 203–a)	3	
Dendrology (For. 2–a)	4	
Elementary Economics (Econ. 201–a)	3	
Vegetable Gardening (Hort. 202–a)	3	
Greenhouse Management (Hort. 203–a)	3	
Farm Management (Agron. 205–b)		3
Animal Diseases (A. H. 204–b)		3
Animal Breeding (A. H. 205–b)		3
Market Milk (D. H. 204–b)		3
Cheese and Ice Cream (D. H. 205–b)		4
Forest Mensuration (For. 6–b)		4
Home Decoration (Hort. 204–b)		3
Orchard Problems (Hort. 205–b)		2
Farm Poultry (P. H. 202–b)		3

*DESCRIPTION OF STUDIES OF TWO-YEAR COURSE IN AGRICULTURE

AGRONOMY

FREDERICK W. TAYLOR, *Professor*

201–a. **Farm Equipment.** This subject will include the mapping of farms, leveling for drains, a study of farm implements and of farm buildings. Practical exercises are given in map making, laying out drains, comparing farm machines, rope splicing, etc. Mr. Taylor.

Required second year. 3 credits: 2 recitations; 1 laboratory.

202–a. **Field Crops.** Lectures and recitations on the culture, uses and value of the field crops grown in New England. Laboratory practice will include seed testing, seed identification, corn and potato judging, hay judging, and a study of the different legumes, grasses and grains. Mr. Eastman.

Required second year. 3 credits: 2 lectures; 1 laboratory.

203–b. **Soils.** Text book and recitations upon the physical and chemical properties of soils. The subject will be made as practical as possible in its application to farm work. Laboratory experiments will be performed to illustrate the principles studied. Mr. Eastman.

Required second year. 3 credits: 2 recitations; 1 laboratory.

* Only Two-Year students in Agriculture are admitted to these subjects, except by special arrangement with the Dean.

204-b. Manures and Fertilizers. Text book and recitations upon the constituents of farm manures, the home-mixing of fertilizers, and the modifications required by different soils and crops. Mr. Taylor.

Required second year. 3 credits: 3 lectures.

205-b. Farm Management and Accounting. Text book, lectures and recitations upon different types of farming, size of farms, cropping systems, live-stock problems, marketing farm products, choice of a farm, and farm records and accounts. Practical work in laying out farms, keeping cost accounts on farms, and analyzing and organizing the farm business. Mr. Eastman.

Elective second year. 3 credits: 2 lectures; 1 laboratory.

ANIMAL HUSBANDRY

201-b. Types and Breeds of Live Stock. A study of the different breeds of horses, cattle, sheep, and swine in respect to their origin, history, development, characteristics, and adaptability to different conditions of climate and soil. One afternoon each week is devoted to judging the different breeds. Mr. Fawcett.

Required first year. 4 credits: 3 lectures; 1 laboratory.

202-b. Feeds and Feeding. An elementary study of the laws of nutrition, the character, composition, and digestibility of feed stuffs, and the methods of feeding different kinds of farm animals. Numerous samples of grains and by-products are used for the purpose of familiarizing the students with the different feed stuffs. Practice is given in calculating rations for various purposes. Mr. Fawcett.

Required second year. 3 credits: 2 recitations; 1 laboratory.

203-a. Anatomy of Farm Animals. Lectures and recitations upon the form and structure of the domesticated animals. Skeletons, various anatomical specimens, models, charts, and lantern slides are used to make the subject as practical as possible. The purposes of this subject are to show the relation between the skeleton and the form and function of the animal, and to serve as a foundation for the intelligent study of animal diseases and ailments. Mr. Eckman.

Elective. 3 credits: 2 recitations; 1 laboratory.

204-b. Animal Diseases. A study of some of the more common economic infectious and non-infectious diseases of farm animals, their prevention and their treatment. Mr. Eckman.

Elective. 3 credits: 2 recitations; 1 laboratory.

205-b. Animal Breeding. A study of the principles and practices of animal breeding. Practice is given in tracing pedigrees. Mr. Fawcett.

Elective second year. 3 credits: 2 recitations; 1 laboratory.

BOTANY

201-a. Elements of Botany. In this subject the student is given a succinct account of the form and structure of plants and of how plants grow and feed. Mr. Doran.

Required first year. 3 credits: 1 lecture; 2 laboratories.

202-b. Fungous Diseases of Plants. The principal fungous diseases, their cure and their prevention. Mr. Doran.

Required first year. 2 credits: 1 lecture; 1 laboratory.

CHEMISTRY

201-a. Agricultural Chemistry. A study of the elementary principles of chemistry with special emphasis upon the elements of importance in agriculture. Mr. Kraybill.

Required first year. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

202-b. Agricultural Chemistry. Elements of the chemistry of plants, soils, fertilizers, manure, lime, foods, animal physiology, spray materials and dairy products. Mr. Kraybill.

Prerequisite: Agricultural Chemistry 201-a. Required first year. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

DAIRY HUSBANDRY

201-a. Farm Dairying. A general survey of the field of dairy husbandry. Such topics as the use of the Babcock test, farm separators, farm buttermaking and farm cheesemaking, and marketing dairy products, are included. Mr. DePew.

Required first year. 3 credits: 2 lectures; 1 laboratory.

202-a. Milk Production. The field of dairy husbandry in its relation to the producer. Feeding dairy animals; systems of herd feeding; silage and soiling; raising dairy animals; dairy herd development; dairy barns; advanced registry management; fitting dairy animals for show; dairy cattle judging. Mr. Fuller.

Elective second year. 3 credits: 2 lectures; 1 laboratory.

203-a. Buttermaking. A study of the secretion and of the chemical and physical properties of milk; pasteurization; cream ripening, starters, churning; organization and operation of factories. Mr. DePew.

Elective second year. 3 credits: 2 lectures; 1 laboratory.

204-b. Market Milk. Food value of milk; production, handling and distributing of market and certified milk; dairy farm inspection; control of milk supply. Mr. DePew.

Elective second year. 3 credits: 2 lectures; 1 laboratory.

205-b. Ice Cream and Cheesemaking. (1) Lectures and laboratory work covering the manufacture of the more important types of cheese. (2) The making, handling, and marketing of ice cream and ices. Mr. DePew.

Elective second year. 4 credits: 2 lectures; 2 laboratories.

ARCHITECTURE AND DRAWING

201-b. Agricultural Drawing. A brief study of the use of drafting instruments, followed by sketches and working drawings of wood and concrete construction as applied to farm mechanics and farm buildings. Mr. Shramm.

Required second year. 2 credits: 2 drawing periods.

ECONOMICS

201-a. Introduction to Agricultural Economics. Attention will be given to the essentials of Agricultural Economics as well as to the underlying principles of economics in general. Principles which determine the value of commodities, the rent of land, the wages of labor and the interest of capital, will be considered. Lastly, attention will be given to money and banking in their relation to the industry of agriculture. Mr. McKay.

Elective second year. 3 credits: 1 lecture; 2 recitations.

ENGLISH

201–a, 202–b. Grammar and Elementary Composition. Mr. Richards.

Required first year. 3 credits: 3 recitations.

ENTOMOLOGY

201–b. Principles of Economic Entomology. The relation of the structure and classification of insects to methods of insect control. The preparation and application of insecticides. Spray machinery and appliances. Mr. O'Kane and Mr. Cleveland.

Required second year. 3 credits: 2 recitations; 1 laboratory.

FORESTRY

201–a. Farm Forestry. The care and management of farm woodlots; log and board sealing; logging and milling; estimating standing timber; protection from fire, insects, fungi, etc.; thinning immature stands; seeding and planting; natural regeneration. Mr. Woodward.

Required second year. 3 credits: 2 lectures; 1 laboratory.

HORTICULTURE

201–a. Fruit Growing. This subject embraces a study of commercial orcharding. Each fruit is studied with reference to planting, cultivating, pruning, fertilizing, picking, packing, storing and marketing. Mr. Wolff.

Required first year. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

202–a. Vegetable Gardening. A study of the commercial methods of vegetable growing. Special attention is given to the home garden. Mr. Hepler.

Elective second year. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

203–a. Greenhouse Management. Combined lecture, demonstration and laboratory work in greenhouse management. Mr. Hepler.

Elective second year. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

204-b. Home Decoration. A study of ornamental trees, shrubs and flowers; their culture, proper arrangement and decorative value, with special reference to the home surroundings. Mr. Hepler.

Elective second year. 3 credits: 1 lecture; 1 recitation; 1 laboratory.

205-b. Orchard Problems. This subject deals with the principal problems of farm and commercial orchard management. It is designed to show the application of the principles of fruit growing to practical conditions. Mr. Gourley.

Elective second year. 2 credits: 2 lectures.

POULTRY

201-a, 202-b. Farm Poultry. A general subject designed especially for Two-Year students who are going back to the farm to take up practical poultry work. The subject will include work in managing, feeding, housing, breeding, incubation, brooding, and marketing, with laboratory work as practical as can be made. Mr. Richardson.

3 credits: 2 lectures; 1 laboratory.

SHOP WORK

201-b. Wood Work. Farm carpentry and joinery. Care and use of tools, making of implements for the farm, and care of lumber on the farm. Mr. Batchelder.

Required first year. 2 credits: 2 laboratories.

202-b. Forging. This is a study in the forging of iron and steel and is designed to teach the operation of drawing, upsetting, welding, twisting, splitting, and punching. A study is made of the construction, care and management of the forge and instruction is given in tempering, case hardening and annealing.

Required first year. 1 credit: 1 laboratory.

ZOÖLOGY

201-a. Human Anatomy and Physiology. A general survey of the structure and physiology of the human body. The most important principles of hygiene will be pointed out from time to time as various systems are discussed. Miss Phelps.

Required first year. 3 credits: 3 lectures.

NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION

JOHN C. KENDALL, *Director*

HISTORICAL SKETCH

In order that research work on agricultural problems might be undertaken in New Hampshire, a branch of the college, known as the New Hampshire Agricultural Experiment Station, was established by the state, August 4, 1887, under an act of congress of March 2 of that year, known as the Hatch Act in honor of its author. This act appropriated $15,000 annually for the maintenance of an agricultural experiment station in each state, providing as follows:

"That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural and artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states and territories." The act also provides that the results of such work shall be published in bulletins and reports.

A further endowment of the experiment stations to provide specifically for research work was made by the Adams Act, passed by congress and approved March 16, 1906, which amounts to $15,000 each year. This appropriation is specifically limited to the "necessary expenses of conducting original researches or experiments," and the rulings of the United States Department of Agriculture, which is vested with the supervision of the expenditures under this act, require that this appro-

priation be spent in fundamental investigations or researches to determine the underlying causes and principles of agricultural science, rather than for mere experiments to secure results of immediate practical application as contemplated under the Hatch Act appropriation. The purposes of the two acts are, therefore, supplementary but distinct.

The New Hampshire Agricultural Experiment Station is organized as a department of the New Hampshire College of Agriculture and the Mechanic Arts, and is administered by a board of control, elected by its board of trustees.

WORK OF EXPERIMENT STATION

The investigations conducted by the New Hampshire Agricultural Experiment Station vary according to their nature, some lasting through one season only and some covering a period of years. Projects carried on under the Adams Act are limited by the act of congress to fundamental investigations to determine the underlying principles of agricultural science, while those under the Hatch Act may be of more immediate practical application. The station thus aims to contribute not only to the universal fund of knowledge relating to agriculture, but also to the problems peculiar to farming in New Hampshire. Experiments having the latter end in view have been conducted not only at Durham but in various sections of the state.

Advantage of the opportunities offered by the experiment station has been taken by the state in connection with the tests of seeds, fertilizers, and feeding-stuffs; and samples of these collected by the State Department of Agriculture are tested at the station laboratories each year, in accordance with legislative enactments.

Information relating to agricultural practices is supplied by the various departments and entails a large volume of correspondence in answer to individual inquiries. Samples of soil are tested, and plants and insects are identified. During the past year blood samples from over 10,000 hens have been tested in connection with the campaign against white diarrhea of chickens.

EXPERIMENT STATION LIBRARY

The experiment station library, which is open daily to students and visitors, contains complete files of all bulletins issued by experiment stations in other states, all United States Department of Agriculture bulletins, and many other reports, bulletins and records as well as books of agricultural value.

NEW HAMPSHIRE COLLEGE

PUBLICATIONS

The publications of the station comprise 194 bulletins of the regular series and 21 circulars, 15 technical bulletins, 14 scientific contributions, and 4 school bulletins. The bulletins are issued at irregular intervals and are sent to all residents of New Hampshire requesting them. The station has a mailing list of 23,000 addresses. Back numbers will be sent as long as the supply lasts. Lists of available publications will be sent upon request.

LIST OF PROJECTS

Following is a list of some of the principal projects conducted by the departments of the experiment station during the past year. Adams projects are printed in italics. A more complete description of the station work may be found in the latest printed report.

Agronomy Department.—Variety tests of ensilage corn, field beans, and small grains, including spring wheat, barley and oats. Improvement of timothy by selection and breeding. F. W. Taylor, agronomist, and M. G. Eastman, assistant agronomist.

Animal Husbandry Department.—*Sheep breeding. Nutrition studies.* The cost of wintering steers in New Hampshire. E. G. Ritzman, animal husbandman.

Botany Department.—*Study of the effect of fungicides and insecticides on plants. Study of the toxic action of fungicides to parasitic fungi.* The control of the white pine blister rust on ribes. Snap-dragon rust and its control. Effect of temperature on the keeping quality of potatoes. Bean anthracnose. Effect of strength in copper sulphate and character of bordeaux mixture on the number of applications necessary to afford protection from late blight. O. R. Butler, botanist, and F. C. Werkenthin, assistant botanist.

Chemistry Department.—*Study to determine at what time in the life of cereals potassium must be applied to produce normal growth. Control studies on the effect of fungicides and insecticides on plants: adhesiveness of spray materials. A method for the quantitative determination of arsenic when plant substances are present in the material to be analyzed.* H. R. Kraybill, chemist, and T. O. Smith, research chemist.

Entomology Department.—*Control of root maggots by insecticides.* An investigation of the apple leaf miner and its reaction to application of contact insecticides. Control of black flies. Insect record. Life history and control of the common stalk borer. Insecticidal properties

of hellebore. W. C. O'Kane, entomologist, and C. R. Cleveland, assistant entomologist.

Forestry Department.—Experiments in establishing artificial forests of different species in New Hampshire. Experiments in immature white pine stands. K. W. Woodward, forester.

Horticultural Department.—*Fruit bud formation. Plant breeding: Mendelian inheritance in squashes.* Variety tests of apples, plums, and small fruits. Study of the status of the blueberry industry in the state. Adaptation of varieties of tomatoes to New Hampshire conditions. Experiment on use of manures, commercial fertilizers and green crops for maintaining soil fertility in vegetable gardens. Experiment on storage pits and trenches for root crops and cabbage. Experiment in pruning young apple trees. Experiment in fertilizing peach orchards. J. H. Gourley, horticulturist, W. H. Wolff, assistant horticulturist, and J. R. Hepler, assistant in vegetable gardening.

Poultry Department (in coöperation with the Botany Department).—Elimination of white diarrhea. A. W. Richardson, poultryman, and F. C. Werkenthin, assistant botanist.

NEW HAMPSHIRE COLLEGE EXTENSION SERVICE

JOHN C. KENDALL, *Director*

WORK OF EXTENSION SERVICE

What the colleges and universities are to those young men and young women who come within their walls, the extension service is, only to a lesser degree, to the thousands who are beyond the reach of the classroom.

The teachings of the college and the findings of the experiment station and the United States Department of Agriculture are now being carried to farms and homes throughout the state by a regularly established force of field workers. As a result of the coöperative arrangement, first made possible by the Smith-Lever law, between the United States Department of Agriculture, the state college and the counties of the state, there are at present county agricultural agents in all ten counties and home demonstration agents in six counties of the state. Boys' and girls' club work, farm management demonstrations and cow-test associations are also conducted with specialists in charge.

The extension service works largely through the organization of the Farm Bureaus, one of which has been formed in each county. The Farm Bureau is composed of farmers and farm women; and so far as possible the extension work is conducted along the lines requested by the people whom it is designed most to help.

With its own corps of twenty-three men and women the extension service relieves the college teaching staff and station workers from much of the miscellaneous extension work which they, of necessity, have been compelled to carry on in the past. It also carries the work to a much larger public and in a much more intimate way than it would otherwise be possible to do. It is very difficult to place any just estimate upon the value of such service to a state or to the nation. It is recognized today as never before that upon the prosperity of the farmer depends quite largely the general prosperity of all classes of people. The present high cost of living has done much to attract the attention of people to the relation which the farmer and his interests bear to them personally.

EXTENSION SERVICE

PUBLICATIONS

The publications of the extension service comprise 114 press bulletins, 44 circulars and 10 bulletins. The county Farm Bureaus publish monthly papers dealing with Farm Bureau activities, and the central extension office publishes a monthly Extension Service News. The extension bulletins are sent to a mailing list, which is maintained in coöperation with the experiment station, and which contains 23,000 names. Bulletins are sent free to all who request them.

Reading courses in thirteen subjects in agriculture and home economics, prepared by members of the resident college staff, are offered during the winter months and last year enrollments totaled 677.

LIST OF EXTENSION PROJECTS

Following is a brief description of the principal projects conducted by the extension service during the past year. Further information regarding the extension work may be found in the printed extension reports.

Work of the Central Office.—Matters of relationships are arranged by the director, who has charge of the general administration of extension activities. A bureau of information is maintained, connecting the people of the state with the college departments. Publications are issued, reading courses handled, informational articles sent to newspapers, and arrangements made for speakers and demonstrators.

Work of County Agricultural Agents.—Each county now has an agricultural agent. Work has been conducted in lime demonstrations, home-mixing of fertilizers, legume demonstrations, variety tests, seed improvement, potato blight, orchard management, elimination of insect pests, dairy improvement, poultry improvement, elimination of scrub sires, tuberculosis eradication, farm management work, coöperative marketing, farm credits, and community improvement. The work is under the supervision of E. P. Robinson, county agent leader.

Work for Dairy Improvement.—Eleven cow-test associations are operated in the state under this project. Elimination of low-producing cows, the introduction of better breeding methods, better feeding and care are emphasized. The work is under the supervision of F. L. Brown, agent in dairying.

Farm Management Demonstrations.—This project is devoted largely to demonstrations in the keeping of farm accounts, and the possibilities shown by such accounts for better farm management. Figures on the

cost of milk production, cost of silage, pasture and labor prices have also been obtained. The work is under the supervision of A. B. Genung, farm management demonstrator.

Home Demonstration Work.—Six counties now have home demonstration agents, and an assistant leader covers in a less intensive way the other four counties. Work has been done on balanced rations for the family, hot school lunches, preservation of foods, child feeding, health, home care of the sick, home sanitation, clothing construction, labor-saving conveniences, household accounts, marketing of home products, installation of district nurses, community rest-rooms and work for community improvement. The work is under the supervision of Miss B. E. Titsworth, home demonstration leader, and Miss D. D. Williamson, assistant leader.

Boys' and Girls' Club Work.—Instruction to juniors has been given in the raising of home gardens, sweet corn, field corn and potatoes, the keeping of pigs, dairy cows and poultry, the canning of food, bread-making and sewing. The work is under the supervision of H. A. Mostrom, state club leader, and Miss M. L. Sanborn, assistant state club leader.

Reading Courses.—The reading courses given by the resident staff are as follows:

Soils and Fertilizers. Mr. M. G. Eastman.
Farm Crops. Mr. M. G. Eastman.
Farm Stock. Mr. O. L. Eckman.
Orchard Management. Mr. W. H. Wolff.
Dairy Farming. Mr. J. M. Fuller.
Poultry Husbandry. Mr. A. W. Richardson.
Swine Husbandry. Mr. C. J. Fawcett.
The Farm Woodlot. Mr. K. W. Woodward.
Vegetable Gardening. Mr. J. R. Hepler.
Bee-Keeping. Mr. W. H. Wolff.
Feeding the Family. Miss Louise Knight.
Clothing the Family. Miss M. L. Caton.
Household Management. Miss Isa A. Greene.

DEGREES AND HONORS, 1919

BACHELOR OF SCIENCE

Agricultural Division

Otto Winfred Davis . . . . . Concord
John Frank Durgin . . . . . Newmarket
Cecil Calvert Dustin . . . . . Rochester
Norman Frank Glidden . . . . . Alton Bay
Gordon Thayer Nightingale . . . . . Petersham, Mass.
Oral Allen Page . . . . . Newton
William Edward Shuttleworth . . . . . Portsmouth
Lewis Blake Tilton . . . . . East Kingston
William Crawford Wheeler . . . . . Starrking

Arts and Science Division

Charles Alfred Bennett . . . . . Durham
Clement Chipman Belyea . . . . . Newmarket
Muriel Chamberlin . . . . . Berlin
Henry Benson Caswell . . . . . Barnstead
Alice Bowdoin Kemp . . . . . Kingston
Constantine A. Petmezas . . . . . Portsmouth
Christine Flora Randall . . . . . Plymouth
Mary Flora Poland . . . . . Lebanon
Hamilton Rumrill . . . . . Hillsborough
Mabel Foster Smith . . . . . Claremont

Home Economics Section

Olive Irene Ashford . . . . . Dover
Margaret Edna Baker . . . . . Littleton
Priscilla Benson . . . . . Lebanon
Blanche Farnum Dimond . . . . . West Concord
Mildred Eva Doherty . . . . . Derry
Christine Jane Sutherland Grant . . . . . Plymouth
Marion Anna Lewis . . . . . Littleton
Madelene Lona Pinkham . . . . . Dover
Bernice Aurilla Robb . . . . . Durham
Miriam Augusta Sanders . . . . . Rochester
Susie Ethel Seawards . . . . . Dover

Hazelle Maude Shedd ..... Rochester
Gertrude May Smith ..... Epping
Ida Marion Wiggin ..... Dover
Katherine Williams ..... Exeter
Emma Louise Wetherbee ..... Milford

Engineering Division

Edward Emery Bartlett ..... Derry
Thomas Joseph Cochrane ..... Ludlow, Mass.
Louis Benjamin Hoffman ..... Manchester
Alden Howard Moody ..... Concord
Carl Frederick Matthes ..... Lawrence, Mass.
Willard Eugene Nudd ..... Hampton
Carleton Lord Came ..... Somersworth

BACHELOR OF ARTS

Grace Etta Atwood ..... Worcester, Mass.
Arthur Everett Clapp ..... Portsmouth
Mary Robinson Cressey ..... Dover
Oscar Leavitt Garland ..... Hampton
Sara Ella Greenfield ..... Rochester
Dorothy Adaline Hale ..... Dover
Dorothy Hanson ..... Franklin
Mary Ethel Kelleher ..... Dover
Ada Carolyn Langley ..... Durham
Mary Elizabeth McCarty ..... Dover
Caroline Mary Perkins ..... Claremont
Frank William Prescott ..... Pittsfield
Louise Mary Richmond ..... Dover
Melba Johnson Shuttleworth ..... West Springfield, Mass.
Clarence Wilson Sleeper ..... Concord
John Fremont Stafford ..... Berlin
Murray Hartshorn Strain ..... Groveton
Alpheus Britton White ..... Peterborough

TWO YEAR CERTIFICATES IN AGRICULTURE

Souren Seghpos Ajemian ..... Portsmouth
Paul Blodgett Evans ..... Nashua
Freeman Mark Grimes ..... West Medford, Mass.
Arthur Roscoe Mann ..... Melrose Highlands, Mass.
Harley Frederick Northrop ..... Williamstown, Mass.

HONOR LIST FOR 1919

SPECIAL HONORS

Average of 90 or more for year's work

1919

Mary Robinson Cressy.
Dorothy Hanson.
Alice Bowdoin Kemp.

1920

Esther Lucile Brown.
Florence Aura Kelley.

1921

Mary Ann Catherine Boyd.
Harriet May Ford.

1922

Martha Gorham Higgins.

HONOR

Average of 85 or more for the year's work

1919

Arthur Everett Clapp.
Muriel Chamberlin.
Sara Ella Greenfield.
Dorothy Adaline Hale.
Ada Carolyn Langley.
Caroline May Perkins.
Madelene Lona Pinkham.
Louise Mary Richmond.
Alpheus Britton White.
Frank William Prescott.

1920

Helen Miller Barton.
John J. Bloomfield.
Azelia Beatrice Brooks.
Evangeline Hester Edgerly.
Harry Johnson Harling.
Ethelle Meserve Hayes.
Judith Varney Jenness.
Leslie George Jenness.
Frances Kling.
Marjory May Saxton.
Jennie Mae Shannon.
Deborah Beatrice Smith.
Phebe Key Stryker.
Ralph Joy Young.

1921

Kathryn Margaret Aldrich.
Louise Burdett.
Sarah Hortense Cavis.
Dorothy Chase.
Ruth Emeline Colburn.
Florence Durkee Hatch.
Alice R. Knox.
Delia Frances Langley.
Eleanor Frances Leahy.
Helen Hawkes Meader.
Edmund George Riel.
Alice Hovey Scott.
Dorothy Belle Shand.
Dorothy Pauline Wentworth.

1922

Stanley Joseph Alling.
Perley Fernando Ayer.
Elvira Libby Benfield.
Marion Emma Berry.
Decima Inez Doyle.
Lyle Clayton Jenness.
Kathrine Thompson.
Edythe May Tingley.

PRIZE RECORD FOR 1919

BAILEY PRIZE

Given by Dr. C. H. Bailey, Class of '79, and E. A. Bailey, Class of '85

Alden H. Moody, Concord.

ERSKINE MASON MEMORIAL PRIZE

Caroline May Perkins, Claremont.

CHASE-DAVIS MEMORIAL MEDALS

Gold Medal

William Edward Shuttleworth, Portsmouth.

Silver Medal

Gordon Thayer Nightingale, Petersham, Mass.

LILLIAN S. EDWARDS PRIZE

Ida Marion Wiggin, Dover.

VALENTINE SMITH SCHOLARSHIPS

John Jacob Bloomfield, '20, Dover.
Harriet May Ford, '21, South Danbury.
Edson Martin Bailey, '22, Sunapee.
Mary Robinson Cressey, '19, Dover.

THE RESERVE OFFICERS TRAINING CORPS

NEW HAMPSHIRE COLLEGE R.O.T.C. INFANTRY BATTALION

Major Alfred E. McKenney, *Commanding.*
First Lieutenant Irving F. Sherwood, *Adjutant.*

BAND

Chief Musician Edward S. Ross.
Drum Major Francis M. Champaigne.

COMPANY "A"

Captain John M. True.
Second Lieutenant George W. Weston.

COMPANY "B"

Captain Howard P. Kelsey.
First Lieutenant Michael F. O'Leary.
Second Lieutenant Douglas H. Dexter.

COMPANY "C"

Captain Gordon W. Patten.
First Lieutenant Arthur P. Callin.
Second Lieutenant Costas Aganostopoulas.

COMPANY "D"

Captain Carlton M. Strong.
First Lieutenant Orin C. Whitney.
Second Lieutenant Harold B. Wood.

FIRST COMPANY NEW HAMPSHIRE COLLEGE COAST ARTILLERY R.O.T.C.

Captain Paul J. Bailey.
First Lieutenant Chandler Eastman.
Second Lieutenant Carl D. McKelvie.

STUDENTS, 1919–1920

The abbreviations used are as follows: *A. & S.* = Arts and Science; *Agri.* = Agriculture; *Engr.* = Engineering.

GRADUATE STUDENTS

Name	Course	P. O. Address
Chamberlin, Muriel	*A. & S.*	*Barre, Vt.*
Fogg, Herman Charles	*Engr.*	*Durham*
Hale, Dorothy Adeline	*A. & S.*	*Dover*
Nightingale, Gordon Thayer	*Agri.*	*Moosup, Conn.*
Ross, Edgar Samuel	*Engr.*	*Durham*

SENIORS

Abbot, Howard Stanley	*Agri.*	*Milton*
Adams, Helen Gertrude	*A. & S.*	*Durham*
Akerman, Wallace Sheldon	*Engr.*	*Portsmouth*
Aldrich, Katherine Spurlin	*A. & S.*	*Whitefield*
Atkins, Harry Clifton	*Engr.*	*Danbury*
Bailey, Mary Elizabeth	*A. & S.*	*Durham*
Banister, Rolfe George	*Agri.*	*Colebrook*
Barker, Forrest Allen	*Engr.*	*Nashua*
Barton, Helen Miller	*A. & S.*	*Seabrook*
Bell, Ernest Lorne	*A. & S.*	*Plymouth*
Bickford, Gladys Charlotte	*A. & S.*	*Gonic*
Billingham, George Harold	*A. & S.*	*Boston, Mass.*
Binks, Doris Reba	*A. & S.*	*Franklin*
Blood, Kenneth Darwin	*Agri.*	*Claremont*
Bloomfield, John Jacob	*Engr.*	*Dover*
Boutwell, Harley	*A. & S.*	*Concord*
Brooks, Beatrice Azelia	*A. & S.*	*Dover*
Brooks, Frank Arthur	*Engr.*	*Manchester*
Brown, Arthur Butler	*Agri.*	*Fremont*
Brown, Esther Lucile	*A. & S.*	*Newfields*
Browne, Winnifred Pearl	*A. & S.*	*Manchester*

Name	Course	P. O. Address
Burleigh, Lucile Edna	*A. & S.*	*Franklin*
Callender, Benjamin Richard	*Engr.*	*Bethlehem*
Carr, James Irvin	*Engr.*	*Hancock*
Clarke, Daniel William	*A. & S.*	*Schenectady, N. Y.*
Cree, Leighton Joseph	*Agri.*	*Colebrook*
Cummings, Flora Belle	*A. & S.*	*Colebrook*
Currier, Maurice Emerson	*A. & S.*	*Dover*
Davis, Arthur Franklin	*A. & S.*	*Portsmouth*
Dearborn, Hazel Ruth	*A. & S.*	*Durham*
Donahue, Helen Bernadine	*A. & S.*	*Waltham, Mass.*
Edgerly, Eva Hester	*A. & S.*	*Newmarket*
Elkins, Dorice White	*A. & S.*	*Hampton Falls*
Emery, Ralph Benton	*Agri.*	*Springvale, Me.*
Felker, Harold Perkins	*Agri.*	*Laconia*
Fitch, Harold Wakefield	*Agri.*	*Claremont*
Fitts, Perley Irving	*Agri.*	*Etna*
Foster, Russell Chase	*Engr.*	*Fitchburg, Mass.*
Furber, Miriam Louise	*A. & S.*	*Wolfeboro*
Gardner, Celia Hubbard	*A. & S.*	*Springfield*
Gove, Norris Dickinson	*Engr.*	*Raymond*
Greer, Raymond Chase	*A. & S.*	*Grasmere*
Griswold, James Herbert	*Agri.*	*Springfield, Vt.*
Ham, Harold Rudman	*Agri.*	*Durham*
Harling, Harry Jonathan	*Agri.*	*Jaffrey*
Haseltine, Franklin Lowell	*Agri.*	*Reed's Ferry*
Hayes, Ethelle Meserve	*A. & S.*	*Dover*
Hill, William Rodney	*A. & S.*	*Concord*
Hilliard, William Russell	*Agri.*	*East Kingston*
Howe, George Merrill	*A. & S.*	*Contoocook*
Hyde, Lincoln Spencer	*Agri.*	*East Kingston*
Jenness, Judith Varney	*A. & S.*	*Dover*
Jenness, Leslie George	*Engr.*	*Danbury*
Jones, Lucie Jeanette	*A. & S.*	*Milton*
Joy, Frank Adin	*Eng.*	*Newfields*
Joy, Grace Mae	*A. & S.*	*Newmarket*
Kelley, Florence Aura	*A. & S.*	*Plaistow*
Kling, Frances	*A. & S.*	*Concord*
Ladd, Harold Marden	*Agri.*	*Bristol*
Lane, Chester Linward	*Engr.*	*Concord*

Name	Course	P. O. Address
Langley, Mildred Mae	*A. & S.*	*Durham*
Lewis, Miriam	*A. & S.*	*Chester*
Lynde, Leslie Eugene	*Engr.*	*Dover*
McConachie, Max	*Engr.*	*Manchester*
McQuesten, Ruth Carolyn	*A. & S.*	*Manchester*
Martin, Giles	*A. & S.*	*Manchester*
Melville, George Donald	*A. & S.*	*Newfields*
Meserve, Jessica Frances	*A. & S.*	*Dover*
Morrill, Clyde Rex	*A. & S.*	*Dover*
Morrison, Cecil Alester	*A. & S.*	*Rochester*
Murphy, Helen Ann	*Engr.*	*Concord*
Nelson, Daniel Horace	*Agri.*	*Franconia*
Norris, Edith Priscilla	*A. & S.*	*East Derry*
O'Leary, Christopher James, Jr.	*A. & S.*	*Newfields*
Ordway, Frederick Ira, Jr.	*A. & S.*	*Manchester*
Otis, Rena Frances	*A. & S.*	*Rochester*
Owen, Wilfred Lester	*Engr.*	*Colebrook*
Patten, Gordon Willis	*A. & S.*	*Manchester*
Patterson, Frank Edward	*A. & S.*	*Portsmouth*
Paul, Samuel Henry	*Engr.*	*Wakefield*
Perkins, Charles Gladstone	*Engr.*	*Portsmouth*
Pike, Otis William	*Engr.*	*Antrim*
Pingree, George Nathan	*Engr.*	*New London*
Place, Palmer Bruce	*Engr.*	*Newmarket*
Plaisted, Guy Edgar	*Engr.*	*Portsmouth*
Rice, Dorothy Frances	*A. & S.*	*Dover*
Rogers, Walter Eugene	*A. & S.*	*Sanbornville*
Saxton, Marjorie May	*A. & S.*	*Manchester*
Scammon, Chester Allen	*Engr.*	*Stratham*
Shannon, Jennie Mae	*A. & S.*	*Epping*
Shillaber, John James	*Engr.*	*Portsmouth*
Smith, Arthur Deane	*Agri.*	*Andover*
Smith, Deborah Beatrice	*A. & S.*	*Newfields*
Stearns, Sam Loring	*Agri.*	*Manchester*
Stryker, Phebe Key	*A. & S.*	*Georges Mills*
Thompson, Elmer John	*Agri.*	*Contoocook*
Vose, Milton Raymond	*A. & S.*	*Concord*
Wallace, Grace Ireland	*A. & S.*	*Manchester*
Waterman, Clarence Stanley	*Agri.*	*Durham*

Name	Course	P. O. Address
Watson, Wesley	*Engr.*	*Manchester*
Weigel, Frederick Albert	*Engr.*	*Lawrence, Mass.*
Whipple, Gladys Louise	*A. & S.*	*Lebanon*
Wildes, Karl Leland	*Engr.*	*Belmont*
Young, Ralph Joy	*Agri.*	*Dover*

JUNIORS

Aldrich, Kathryn Margaret	*A. & S.*	*Lancaster*
Anderson, Ernest August F.	*A. & S.*	*New Milford, Conn.*
Ayers, Hazel Marguerite	*A. & S.*	*Rochester*
Bailey, George Rex	*A. & S.*	*West Newbury, Mass.*
Baker, Albert Samuel	*A. & S.*	*Concord*
Batchelder, George Harold	*A. & S.*	*Hampton*
Bearse, Norman Irving	*Engr.*	*Nashua*
Bennett, Robert Goodwin	*Agri.*	*Newmarket*
Blood, Paul Tolman	*Agri.*	*Lisbon*
Boody, Cecil Webster	*A. & S.*	*East Barrington*
Boomer, Stephen Henry	*Agri.*	*Cumberland Mills, Me.*
Boyd, Mary A. Catherine	*A. & S.*	*Dover*
Brosnan, John Andrew	*Agri.*	*Thorndike, Mass.*
*Brown, Donald Stuart	*Engr.*	*Penacook*
Brown, Percival Cyrus	*Engr.*	*Woodstock*
Bugbee, Rachel Rice	*A. & S.*	*Concord*
Burdett, Louise	*A. & S.*	*Leominster, Mass.*
Burpee, Howard Ainsworth	*Engr.*	*Manchester*
Butler, Theodore Rutledge	*A. & S.*	*Portsmouth*
Carpenter, Richard Frederick	*A. & S.*	*Littleton*
Cavis, Hortense	*A. & S.*	*Bristol*
Chaplin, Daniel Reed	*A. & S.*	*Keene*
Chase, Dorothy	*A. & S.*	*Smithtown*
Child, Roswell Towle	*Engr.*	*Pembroke*
Clarke, Hugh Trescott	*A. & S.*	*Canaan*
Cleveland, Margaret Lily	*A. & S.*	*Stowe, Vt.*
Cohen, Abraham Louis	*A. & S.*	*Portsmouth*
Colburn, Ruth Emeline	*A. & S.*	*Temple*
Colton, Leona Brewster	*A. & S.*	*Somerville, Mass.*
*Congdon, Neal Harrison	*A. & S.*	*Lancaster*
Connell, Morelle Meath	*A. & S.*	*Rochester*

*Deceased.

Name	Course	P. O. Address
Conner, Solon Dolloff	*Agri.*	*Exeter*
Cotton, John Melville	*Engr.*	*Portsmouth*
County, Lillian Gertrude	*A. & S.*	*Manchester*
Craig, Thomas Jeffers	*Engr.*	*Portsmouth*
Cross, Clarence Arthur	*Agri.*	*Derry*
Davis, Bernard Milan	*Agri.*	*Hancock*
Davis, Louise Grosvenor	*A. & S.*	*Newton*
Dolloff, Albert Franklin	*A. & S.*	*New Hampton*
Dore, Nellie Jemima	*A. & S.*	*Mirror Lake*
Flanders, Dorothy Alice	*A. & S.*	*Laconia*
Fluet, Rita Beatrice	*A. & S.*	*Dover*
Forbes, Harland Clement	*Engr.*	*Colebrook*
Ford, Harriet May	*A. & S.*	*South Danbury*
Fox, Gordon Lloyd	*A. & S.*	*Lisbon*
Franklin, Jeremiah E.	*Engr.*	*Franklin*
French, Harold Gordon	*Agri.*	*Hudson*
Gerrish, Mary Elizabeth	*A. & S.*	*Dover*
Grant, Leland Elford	*Engr.*	*Rollinsford*
Gray, Walter Benson	*Engr.*	*Rochester*
Hanscom, Florence Evelyn	*A. & S.*	*South Berwick, Me.*
Hartwell, Robert William	*Agri.*	*Littleton, Mass.*
Harvell, Ralph Burbank	*Agri.*	*Laconia*
Hatch, Florence Durkee	*A. & S.*	*Exeter*
Hatch, Horace McNeill	*Agri.*	*Lebanon*
Hauler, Arthur	*A. & S.*	*Biddeford, Me.*
Helff, Otto Maximilian	*A. & S.*	*Keene*
Henessey, Mary Margaret	*A. & S.*	*Dover*
Herlihy, Abby Katherine	*A. & S.*	*Derry*
Hewitt, Ernest Warden	*Engr.*	*Durham*
Hobbs, Ethel Mae	*A. & S.*	*Somersworth*
Hobbs, Horace Estow	*A. & S.*	*Hampton*
Holmes, Myron Gerrish	*Agri.*	*Northwood*
Hubbard, Oliver Jones	*Agri.*	*Walpole*
Hunt, Esther Hazel	*A. & S.*	*Kennydale, Wash.*
Hunt, Raeburn Stanley	*A. & S.*	*Cornish Flat*
Hunting, Ronald Walter	*Engr.*	*Newport*
Huse, Walter Daniel	*Engr.*	*Laconia*
Johnson, Ralph Nathan	*Agri.*	*Newport*
Keene, LaRoy Dwight	*Engr.*	*Kittery, Me.*

Name	Course	P. O. Address
Knox, Alice Richardson	*A. & S.*	*Madbury*
Knox, William Edward	*Engr.*	*Dover*
Ladd, Bessie Ruth	*A. & S.*	*Epping*
Ladd, Frank Watson	*Engr.*	*Contoocook*
Lagassé, Félix Scott	*Agri.*	*Lochmere*
Langley, Delia Frances	*A. & S.*	*Durham*
Lannon, John Martin	*Engr.*	*Penacook*
Leahy, Elinor Frances	*A. & S.*	*Somersworth*
Leavitt, Harold Irving	*Engr.*	*Lowell, Mass.*
Levy, Samuel	*A. & S.*	*Portsmouth*
Litch, Richard Corning	*Engr.*	*Exeter*
Little, Ernest Parker	*Engr.*	*Laconia*
Lorden, Earl Eastman	*A. & S.*	*Gerrish*
McGettigan, Francis Laurence	*Agri.*	*Wilton*
McKenney, Alfred Edwin	*A. & S.*	*Durham*
McKenzie, George	*Engr.*	*Franconia*
Marshall, John Samuel	*A. & S.*	*Kingston*
Marston, James Richard	*Agri.*	*Conway*
Meader, Helen Hawkes	*A. & S.*	*Dover*
Meader, Raymond Brackett	*Engr.*	*Rochester*
Meras, Norman Eugene	*Engr.*	*Exeter*
Meserve, Anna Howard	*A. & S.*	*Durham*
Mooney, Lawrence Henry	*A. & S.*	*Berlin*
Morrill, Alden Seth	*Agri.*	*Franklin*
Morrill, Edith Grace	*A. & S.*	*Penacook*
Morse, Errol Stanley	*A. & S.*	*Tilton*
Murthur, Charles Bernard	*A. & S.*	*Nashua*
Nightingale, Burgess	*Agri.*	*Moosup, Conn.*
Pelton, Winslow Lyle	*Engr.*	*Lancaster*
Pollard, Shirley Everett	*Engr.*	*Newport*
Reardon, John Joseph	*A. & S.*	*Concord*
Reed, John Ephraim	*A. & S.*	*Concord*
Rice, Lee Laughna	*A. & S.*	*Worcester, Mass.*
Riel, Edmund George	*Agri.*	*Laconia*
Sawyer, Alfred Henderson	*Agri.*	*Concord*
Scott, Alice Hovey	*A. & S.*	*Durham*
Scovell, Paul Hayward	*Engr.*	*Haverhill, Mass.*
Shand, Dorothy B.	*A. & S.*	*Manchester*
Shannon, Edwin Howe	*A. & S.*	*Laconia*

Name	Course	P. O. Address
Shaw, Clifton Frank	*A. & S.*	*Tilton*
Shepherd, Charles William	*A. & S.*	*Durham*
Smith, Clara Meredith	*A. & S.*	*Hollis*
Smith, Louis Hutchinson	*Agri.*	*White River Junction, Vt.*
Spinney, Emerson Sumner	*A. & S.*	*Portsmouth*
Spinney, Willard Ellsworth	*Engr.*	*Concord*
Sprague, Marion Wilhelmina	*A. & S.*	*Durham*
Stafford, Henry Walton	*Engr.*	*Berlin*
Steele, James Fiddes	*A. & S.*	*Concord*
Taft, Lorado Edson	*Agri.*	*Gloucester, Mass.*
Thomas, Michael Simon	*Engr.*	*Durham*
Thompson, William Haven	*A. & S.*	*Atkinson*
Torrey, Frederick Lincoln	*Agri.*	*Quincy, Mass.*
True, John George	*Engr.*	*Kennebunk, Me.*
True, Olive Lillian	*A. & S.*	*West Lebanon*
Twaddle, Arthur Eastman	*Engr.*	*Manchester*
Varrill, Roy Merton	*A. & S.*	*Portsmouth*
Wallis, Harriet Blanche	*A. & S.*	*Laconia*
Ward, Janet	*A. & S.*	*Hampton*
Weldon, Ralph Sharples	*Agri.*	*West Concord*
Wentworth, Dorothy Pauline	*A. & S.*	*Dover*
Wiggin, Walter Wentworth	*Agri.*	*Sanbornville*
Wiggins, Gilbert Newton	*Engr.*	*New London*
Woodward, Howard True	*Agri.*	*Berlin*
Wooster, George Edward	*Agri.*	*Concord*

SOPHOMORES

Alling, Stanley Joseph	*Engr.*	*Brookline, Mass.*
Arey, Amber Priscilla	*A. & S.*	*South Danbury*
Ayer, Perley Fernando	*Agri.*	*Manchester*
Bailey, Edson Martin	*A. & S.*	*Sunapee*
Bailey, Paul Joseph	*A. & S.*	*Portsmouth*
Barker, Ruth Morton	*A. & S.*	*Antrim*
Batchelder, William Pickering	*A. & S.*	*Salem*
Bean, Gladys Helen	*A. & S.*	*Newfields*
Bell, Leslie Samuel	*A. & S.*	*Plymouth*
Benfield, Elvira Libby	*A. & S.*	*Exeter*
Bennett, Fred Walter	*A. & S.*	*Bradford, Mass.*
Berry, Marion Emma	*A. & S.*	*North Hampton*

Name	Course	P. O. Address
Bishop, Floyd Eugene	*Engr.*	*Newport*
Blodgett, Randolph Chandler	*Engr.*	*South Sutton*
Boothman, Marion Louise	*A. & S.*	*Randolph*
Boutwell, Llewellyn	*Agri.*	*Concord*
Broderick, Sylvester James	*Engr.*	*Exeter*
Brown, Raymond Chesman	*Engr.*	*Lancaster*
Burleigh, Donald Knowles	*A. & S.*	*Tilton*
Calpin, Arthur Raymond	*Engr.*	*Manchester*
Carpenter, Herbert Stoddard	*A. & S.*	*Plymouth*
Champaigne, Francis Michael	*A. & S.*	*Keene*
Chase, Helen Evans	*A. & S.*	*Smithtown*
Chesley, Guy Kenneth	*A. & S.*	*Rochester*
Christensen, Ernest Waldemar	*Engr.*	*Gloucester, Mass.*
Coffill, George Boyson	*A. & S.*	*Manchester*
Coker, Roland Stanwood	*A. & S.*	*Salem, Mass.*
Cook, Albert Spaulding	*A. & S.*	*Fremont*
Cooper, Lewis Swett	*Agri.*	*Medford, Mass.*
Coutchoucas, Constantina	*A. & S.*	*Manchester*
Cox, Isaac Newton	*Engr.*	*Manchester*
Crosby, Gordon Vaughan	*A. & S.*	*Groveland, Mass.*
Crosby, William Theodore	*A. & S.*	*Groveland, Mass.*
Croteau, Arthur Joseph	*Engr.*	*Marlboro*
Currier, Preston Homans	*A. & S.*	*Plymouth*
Dame, Norman Carleton	*Engr.*	*Rochester*
Darvill, Frederick John	*A. & S.*	*Sanford, Me.*
Dawson, Andrew McGrouther	*Engr.*	*Methuen, Mass.*
Day, Henry Willis	*A. & S.*	*Kennebunk, Me.*
Dickinson, Carl Norman	*Engr.*	*Nashua*
Dodge, Charles Frank	*Engr.*	*Contoocook*
Donovan, Fred David	*A. & S.*	*Ashuelot*
Doolittle, Irving Warren	*A. & S.*	*Portsmouth*
Doran, Robert Harold	*Agri.*	*Littleton*
Doyle, Decima Inez	*A. & S.*	*Exeter*
Dresser, Donald Sylvester	*Engr.*	*Berlin*
Dunn, Henry Linwood	*A. & S.*	*Portsmouth*
Emerson, Lester Straw	*Engr.*	*Pittsfield*
Emery, Frederick Hanscom	*Engr.*	*East Rochester*
Evans, Harold Merrill	*A. & S.*	*Amesbury, Mass.*
Flanders, David James	*A. & S.*	*Manchester*

Name	Course	P. O. Address
Flynn, John Francis	*A. & S.*	*Cliftondale, Mass.*
Ford, Henry Robert	*Engr.*	*Derry*
Fowler, Karl Raymond	*A. & S.*	*Lebanon*
French, Francis Andrew	*Engr.*	*Wilton*
Gadbois, Edgar Leander	*A. & S.*	*Manchester*
Gadd, Thomas Burden	*Agri.*	*Plymouth*
Gale, Shirley Irving	*A. & S.*	*Lebanon*
Gay, Paul Baxter	*Agri.*	*New London*
Germundson, Merrill Andrew	*A. & S.*	*Newton*
Gilmore, Mildred Eudora	*A. & S.*	*Exeter*
Goggin, Jeremiah Francis	*Engr.*	*Dover*
Golding, Norman R.	*Agri.*	*Biddeford, Me.*
Goodwin, Crystal Evelyn	*A. & S.*	*Dover*
Goold, John Exshaw	*Engr.*	*Hanover*
Graham, Edward Dewey	*A. & S.*	*Dover*
Griffiths, Sadie Marion	*A. & S.*	*Durham*
Haggerty, William Jennings	*Engr.*	*Nashua*
Hamblet, Theodore Clement	*Engr.*	*Lawrence, Mass.*
Hatch, Wallace Everett	*A. & S.*	*Boston, Mass.*
Hayes, Clifton Russell	*A. & S.*	*Dover*
Hedburg, Irving Wilfred	*A. & S.*	*Worcester, Mass.*
Higgins, Martha Gorham	*A. & S.*	*Salem Depot*
Hiscock, J. Austin	*A. & S.*	*Conway*
Hoben, Margaret Egan	*A. & S.*	*Manchester*
Holmes, Byron Lucy	*Agri.*	*Northwood*
Holmes, Robert William	*Engr.*	*Dover*
Howard, Hubbard Everett	*Agri.*	*Wentworth*
Hyde, Rhoda Alettha	*A. & S.*	*East Kingston*
Ingham, Howard Vincent	*Agri.*	*Lowell, Mass.*
Jacques, Laura G.	*A. & S.*	*Ashland*
Jacques, Omer Charles	*Engr.*	*Ashland*
Jameson, Ruth	*A. & S.*	*Durham*
Jenness, Lyle Clayton	*Engr.*	*South Danbury*
Johnson, Frederic Knowlton	*Engr.*	*Winthrop, Mass.*
Kavanaugh, Edward Charles	*Engr.*	*Somersworth*
Kelley, Julius Goddard	*A. & S.*	*Dennisport, Mass.*
Kelley, Parker Westbrook	*A. & S.*	*Dennisport, Mass.*
Kelsey, Dorothy Isabelle	*A. & S.*	*Meriden*
Kelsey, Howard Phelps	*A. & S.*	*Meriden*

Name	Course	P. O. Address
Kimball, Ralph Walter	*A. & S.*	*Milton*
Langley, Marland George	*A. & S.*	*Durham*
Lawrence, Oakes Kent	*A. & S.*	*Tilton*
Leach, William Arthur	*Agri.*	*Moultonboro*
Leonard, Janice Marjorie	*A. & S.*	*Worcester, Mass.*
Levingston, Oscar	*A. & S.*	*Concord*
Lowe, Carroll Henry	*A. & S.*	*New Durham*
Lundholm, Carl	*A. & S.*	*Cliftondale, Mass.*
Lyster, Paul John	*Agri.*	*Littleton*
McKelvie, Carl Donald	*A. & S.*	*Nashua*
McKerley, Stillman Ernest	*A. & S.*	*Gerrish*
MacLatchy, Gordon Francis	*Engr.*	*Sunapee*
McNulty, Elizabeth Mary	*A. & S.*	*Manchester*
Mansell, Maurice Ames	*Agri.*	*Durham*
Marden, Marguerite Elizabeth	*A. & S.*	*Troy, N. Y.*
Marsh, Robert French	*Engr.*	*Manchester*
Marshall, Leonard Joseph	*Engr.*	*Salem Depot*
Marshall, Nathalie Emerson	*A. & S.*	*Henniker*
Martin, Adams	*Engr.*	*Pembroke*
Mattoon, Donald Potter	*Agri.*	*Claremont*
Meader, Walter Sidney, Jr.	*Engr.*	*Dover*
Meserve, Winthrop Emerson	*Agri.*	*Durham*
Moriarty, James Joseph	*Agri.*	*Fitchburg, Mass.*
Morrison, Clifton Cole	*Engr.*	*Ashland*
Newman, Derwood Austin	*Engr.*	*West Burke, Vt.*
Northey, Roscoe Lee	*A. & S.*	*Lisbon*
O'Leary, Michael Francis	*A. & S.*	*Portsmouth*
Olsson, Gunnar Bror	*Agri.*	*Chichester*
Paine, Lorin Dresser	*A. & S.*	*Berlin*
Parmenter, Draper Watts	*Agri.*	*Hudson*
Partington, Clyde Nash	*Agri.*	*Dover*
Perry, Robert	*A. & S.*	*Manchester*
Pichette, Edward Albert	*Engr.*	*Concord*
Plummer, Raymond Swain	*A. & S.*	*Laconia*
Proctor, Ralph Harwood	*Engr.*	*Antrim*
Rammer, Hyman Louis	*Engr.*	*Portsmouth*
Reardon, Charles Edward	*A. & S.*	*Concord*
Reardon, Honora Agnes	*Engr.*	*Concord*
Richardson, Raymond Bradbury	*Agri.*	*Gonic*

Name	Course	P. O. Address
Rollins, Howard Arthur	*Agri.*	*West Alton*
Rossell, Joseph Frederick	*A. & S.*	*Concord*
Rowell, Richard Irving	*Engr.*	*Newport*
Rumazza, Edward Frederick	*Engr.*	*Rochester*
Russell, Bruce Eldridge	*Agri.*	*Mount Vernon*
Russell, Fred Cutler, Jr.	*A. & S.*	*Haverhill*
Saunders, Arthur Bruce	*Engr.*	*Nashua*
Sawtelle, Eleanor Prescott	*A. & S.*	*Manchester*
Scott, Elmer Arthur	*A. & S.*	*East Wakefield*
Shea, Theresa	*A. & S.*	*Nashua*
Sherwood, Irving Frederick	*A. & S.*	*Plymouth*
Simonds, Stephen Moses	*A. & S.*	*Lisbon*
Sleeper, Lora Ella	*A. & S.*	*Concord*
Smith, Charles Wesley	*A. & S.*	*Portsmouth*
Smith, Edward Emerson	*Agri.*	*Mason*
Smith, Howard Bruce	*Engr.*	*Newport*
Soderlund, Reginald Albanus	*A. & S.*	*Manchester*
Spinney, Fannie Mae	*A. & S.*	*Dover*
Sprague, M. Gertrude	*A. & S.*	*Durham*
Stanley, Stillman Gay	*Engr.*	*New London*
Stanley, Walter Packard	*A. & S.*	*Daytona, Fla.*
Stevens, Hope	*A. & S.*	*Exeter*
Storey, Edward Jerome	*A. & S.*	*Sanbornville*
Stratton, William Merrill	*Engr.*	*Manchester*
Strong, Carlton Matthew	*A. & S.*	*Concord*
Struthers, Francis William	*A. & S.*	*Townsend, Mass.*
Swain, Charles Andrews	*A. & S.*	*Nashua*
Swasey, Mildred Hodda	*A. & S.*	*Exeter*
Taylor, Millard Renshaw	*Engr.*	*Dover*
Thayer, Royal Goodell	*Agri.*	*St. Albans, Vt.*
Thompson, Donald Tuttle	*A. & S.*	*East Andover*
Thompson, Katharine	*A. & S.*	*East Andover*
Thompson, Laurence Laroy	*Engr.*	*Tilton*
Tibbets, Percy Frederick	*Engr.*	*Somersworth*
Ticknor, Merton Fred	*Engr.*	*Newfields*
Tingley, Edythe Mae	*A. & S.*	*Durham*
Towle, Clayton Woodbury	*A. & S.*	*Conway*
Turner, Howard Edmundson	*Engr.*	*Salem Depot*
Vance, Arlo McCrillis	*A. & S.*	*Union*

Name	Course	P. O. Address
Walker, Kent	*Agri.*	*Newmarket*
Warner, Norwood Allen	*Engr.*	*South Yarmouth, Mass.*
Watkins, Robert Ellbridge	*Engr.*	*Reed's Ferry*
Weston, George Washington	*Agri.*	*Wilton*
Weston, John Prentiss	*Agri.*	*Bennington*
Whitney, Orrin Calvin	*Agri.*	*Charlestown*
Whittier, Helen	*A. & S.*	*Gossville*
Wiggin, Russell Morrison	*A. & S.*	*Whitefield*
Williams, Isaac Langley	*A. & S.*	*Exeter*
Wood, Harold Barnette	*Engr.*	*Portsmouth*
Woods, Ethel Evelyn	*A. & S.*	*Bath*
Woodward, Bert Arthur	*A. & S.*	*Andover*
Yeaton, George Samuel	*Engr.*	*Short Falls*
Young, Esther Hale	*A. & S.*	*Dover*

FRESHMEN

Adams, John Vose	*Engr.*	*Pittsfield*
Adams, Robert Malcolm	*Agri.*	*North Berwick, Me.*
Aldrich, Mills Chase	*Agri.*	*Whitefield*
Allard, Charles Ethan	*A. & S.*	*Exeter*
Allen, Gertrude Vienna	*A. & S.*	*Ashuelot*
Ames, Marjorie	*A. & S.*	*Somersworth*
Anagnostopoulos, Costas D.	*A. & S.*	*Meriden*
Andrew, Dwight Kilton	*Agri.*	*Littleton*
Andrews, Leslie Arthur	*Engr.*	*Quincy, Mass.*
Anthony, Sidney Stewart	*Engr.*	*Manchester*
Baker, Ula Mae	*A. & S.*	*Portsmouth*
Ball, Arnold Carl	*Engr.*	*Nashua*
Bangs, Mildred Mae	*A. & S.*	*Manchester*
Barnes, Herbert F.	*A. & S.*	*Manchester*
Bartlett, Henry Hadley	*Engr.*	*Franklin*
Bartlett, Russell Thompson	*Engr.*	*Amesbury, Mass.*
Basch, Florence Madeline	*A. & S.*	*Winchester*
Bassett, Kenneth Horatio	*Agri.*	*Fremont*
Batchelder, Stanley Parkman	*Engr.*	*Hampton*
Batchelder, Victor Burr	*Engr.*	*Laconia*
Bean, Ralph Lyon	*A. & S.*	*Lebanon*
Bennett, Harry James	*Agri.*	*Winchester*
Bennett, Herbert Clark	*Engr.*	*Alton*

Name	Course	P. O. Address
Berry, Josephine Estelle	*A. & S.*	*Newmarket*
Berry, Kenneth	*Engr.*	*Wolfeboro Falls*
Bickford, Hester Emma	*A. & S.*	*Gossville*
Bissonette, Delphia Louis	*A. & S.*	*Winthrop, Me.*
Black, Arthur	*Engr.*	*Portsmouth*
Blakey, Elmer Francis	*A. & S.*	*Peterboro*
Boodey, Ida Marilla	*A. & S.*	*East Barrington*
Boodey, Jennie May	*A. & S.*	*East Barrington*
Bovin, Joseph Edward	*A. & S.*	*Rumford, Me.*
Boyd, Joseph Aratus	*A. & S.*	*Milton Mills*
Brooks, Elbridge Justin	*Engr.*	*South Eliot, Me.*
Brooks, Lester Fordice	*Engr.*	*Errol*
Brown, Aubrey Myrle	*Engr.*	*Concord*
Brown, Chester Calbot	*A. & S.*	*Goffstown*
Brown, Marguerite Violet	*A. & S.*	*Contoocook*
Browne, Evelyn Ruth	*A. & S.*	*West Rye*
Bugbee, Henry Kimball	*Engr.*	*Concord*
Burnham, John Sheldon	*Engr.*	*Antrim*
Burroughs, Paul	*A. & S.*	*Nashua*
Byrne, Daniel John	*A. & S.*	*Concord*
Callahan, Henry Paul	*A. & S.*	*Concord*
Calpin, Jack Leslie	*Engr.*	*Manchester*
Came, George Hazelton	*A. & S.*	*Somersworth*
Campbell, George Lawrence	*Agri.*	*Medford, Mass.*
Campbell, Howard Wyman	*Engr.*	*Derry*
Campbell, Ronald Burns	*A. & S.*	*Jamaica Plains, Mass.*
Carpenter, Inez Lorena	*A. & S.*	*Littleton*
Carpi, Alfred Edward	*Engr.*	*Manchester*
Carr, John Spencer	*A. & S.*	*Milford, Mass.*
Cassidy, James Patten	*Agri.*	*Concord*
Cassillo, Nicholas Richmond	*A. & S.*	*Keene*
Caverly, Robert Luther	*Agri.*	*Strafford*
Chadbourne, Charles Edward	*A. & S.*	*Manchester*
Chandler, Lawton Brown	*Engr.*	*Concord*
Chase, Alvin Edward	*Engr.*	*Keene*
Chase, Norman Dana	*Engr.*	*Manchester*
Choate, Harold Fairbanks	*Engr.*	*Salem, Mass.*
Clark, Abbott Alfred	*Engr.*	*Concord*
Clark, Richard Foster	*Engr.*	*West Medford, Mass.*

Name	Course	P. O. Address
Clay, Horace S.	*Engr.*	*New Hampton*
Cleaves, Roydon Frank	*Engr.*	*Rochester*
Clement, Angelique Gertrude	*A. & S.*	*Laconia*
Cloutman, John Cecil	*A. & S.*	*Portsmouth*
Coburn, Joseph Bradley Varnum	*Engr.*	*Lowell, Mass.*
Cohen, Caspert	*Engr.*	*Rumford, Me.*
Collins, George Peabody	*Engr.*	*Lakeport*
Columbia, Hervey Dow	*Engr.*	*Canaan*
Columbus, Charles Archie	*Engr.*	*Milton*
Connor, LeRoy Allen	*A. & S.*	*Contoocook*
Cooper, Arthur Gunyon	*A. & S.*	*Exeter*
Corriveau, Rose Marie	*A. & S.*	*Concord*
Corson, Sydney Wingate	*Engr.*	*Rochester*
Cotton, Clyde Rolland	*Agri.*	*Walpole*
Coughlan, Mary Agnes	*A. & S.*	*Hancock*
Cox, Ralph Everett	*Engr.*	*Portsmouth*
Crafts, Ralph Allen	*Engr.*	*Stratham*
Crawford, Howard Egbert	*Engr.*	*Malden, Mass.*
Cree, Rachel Florence	*A. & S.*	*Colebrook*
Cripps, Fred Marshall	*A. & S.*	*Brunswick, Me.*
Crosby, Robert Francis	*Agri.*	*Methuen, Mass.*
Crowell, Milton Frederick	*A. & S.*	*Manchester*
Cummings, Clarence	*Agri.*	*Colebrook*
Cummings, Wilbur	*Agri.*	*Colebrook*
Dares, Alvin Thomas	*Engr.*	*Portsmouth*
Darrah, Carl George	*Engr.*	*Concord*
Davis, Beryle Lucetta	*A. & S.*	*Plymouth*
Davis, Earl Cummings	*Engr.*	*Nashua*
Day, Alfaretta Theresa	*Engr.*	*Gilmanton*
Dearborn, Karl Brock	*Engr.*	*Belmont*
Dearborn, Karl Edson	*A. & S.*	*Bristol*
deCourcy, Arthur Harrison	*A. & S.*	*Portsmouth*
Dickson, Franklin Belmont	*Engr.*	*Milton*
Dion, Wilford Arthur	*A. & S.*	*Tilton*
Dockum, John Freeman	*Engr.*	*Newmarket*
Dodge, Catherine Elizabeth	*A. & S.*	*Contoocook*
Doucet, Maurice Leandre	*A. & S.*	*Manchester*
Downing, Marion Lula	*A. & S.*	*Milton*
Downton, Catherine Emma	*A. & S.*	*Portsmouth*

Name	Course	P. O. Address
Dunbar, Earle Edson	*A. & S.*	*Milford*
Durgin, Elmer Slater	*Engr.*	*Newmarket*
Eastman, Chandler	*A. & S.*	*West Concord*
Edwards, Arline Margaret	*A. & S.*	*Bennington*
Ekdahl (Mrs.) Naomi M.	*A. & S.*	*Nashua*
Elliott, William Henry, Jr.	*Agri.*	*Madbury*
Evans, Gerald Parker	*A. & S.*	*Gorham*
Evans, Phillip Frank	*Engr.*	*Shelburne*
Farmer, Earl Poole	*Agri.*	*Malden, Mass.*
Farnham, Hazel Abbie	*A. & S.*	*Union*
Farrar, Harold Norman	*A. & S.*	*Framingham, Mass.*
Fernald, Harold Thompson	*Agri.*	*Laconia*
Fitts, Charles Albert	*A. & S.*	*Peterboro*
Flanders, Grace Eastman	*A. & S.*	*Laconia*
Fogg, Leander Harold	*A. & S.*	*Durham*
Fogg, Leola Morrison	*A. & S.*	*Durham*
Forbes, Ernest Fred	*Agri.*	*Colebrook*
Fortune, Mabel Elois	*A. & S.*	*Sunapee*
Foster, Dean K.	*A. & S.*	*Concord*
French, Alfred Levi	*Agri.*	*Contoocook*
Friborg, Carl, Jr.	*A. & S.*	*Manchester*
Gallagher, John Sanborn	*A. & S.*	*West Newbury, Mass.*
Garland, William Wallace	*A. & S.*	*Nashua*
George, Jasper Turney	*Engr.*	*Manchester*
Gibbs, Marshall Franklin	*Engr.*	*Farmington*
Giddings, Horace Alpheus	*Engr.*	*Conway*
Gile, Elmer Ernest	*Engr.*	*Lebanon*
Gillis, Melvin Vincent	*Agri.*	*Gorham*
Gilmour, Albert Davis	*Agri.*	*Barton, Vt.*
Glover, Leon Conrad	*Agri.*	*Brookline*
Gordon, Dorothy Marie	*A. & S.*	*Lebanon*
Grace, Marian Elizabeth	*A. & S.*	*New Hampton*
Graves, Charles Edward	*Engr.*	*Exeter*
Griffin, George Harold	*Engr.*	*Manchester*
Grows, Harold Fred	*Engr.*	*Brunswick, Me.*
Gustafson, Richard Leon	*Engr.*	*Manchester*
Hall, Bertram Eldred	*A. & S.*	*Dover*
Hamilton, Stanley Weston	*Agri.*	*Kearsarge*
Harlow, Frank Webster	*Agri.*	*West Medford, Mass.*

Name	Course	P. O. Address
Harrington, Davis Weld	*Engr.*	*West Roxbury, Mass.*
Haubrick, Charlotte Roberts	*A. & S.*	*Windsor, Vt.*
Hawkes, Philip Lloyd	*A. & S.*	*Westbrook, Me.*
Hayes, Michael Edward	*A. & S.*	*Cliftondale, Mass.*
Hayes, Philip Adrian	*Engr.*	*Portsmouth*
Hayes, Stanley Toppan	*Engr.*	*Dover*
Hersey, Carroll Folsom	*A. & S.*	*Wolfeboro*
Hewitt, Vivian Eloise	*A. & S.*	*Durham*
Higgins, Leroy James	*Agri.*	*Littleton*
Hill, Bernice Mary	*A. & S.*	*Center Strafford*
Hill, Carl Leighton	*Agri.*	*Center Strafford*
Hill, Kenneth Francis	*Agri.*	*Center Strafford*
Hoagland, Margaret Louise	*A. & S.*	*Durham*
Hobert, Edward Joseph	*Engr.*	*Marlboro*
Holbrook, Charlotte Sims	*A. & S.*	*Colebrook*
Holland, James Ralph	*Engr.*	*Portsmouth*
Hollenbeck, Jacob Arthur	*Engr.*	*Lisbon*
Holt, Gladys	*A. & S.*	*Suncook*
Holt, Marion Elizabeth	*A. & S.*	*North Haverhill*
Howe, Doris Marguerite	*A. & S.*	*Milton Mills*
Horner, Robert Samuel	*A. & S.*	*Manchester*
Howard, Albert Franklin	*A. & S.*	*Bradford, Mass.*
Huggins, Hugh Marshall	*A. & S.*	*Ottawa, Can.*
Hyde, Leo DeForest	*Engr.*	*Littleton*
Jenkins, Earle Fletcher	*A. & S.*	*Bradford, Vt.*
Jewett, Malcolm Everett	*Engr.*	*Milford*
Johnson, Nelson Peterson	*A. & S.*	*West Lebanon*
Jones, Donald Richardson	*Engr.*	*Nashua*
Jones, Warren Dodge	*Engr.*	*Gonic*
Kelley, Henry Bertram	*Engr.*	*South Yarmouth, Mass.*
Kelley, Warren Thatcher	*Engr.*	*Dennisport, Mass.*
Kemp, Ruth Hancock	*A. & S.*	*Kingston*
Keyser, Frank Ray	*Engr.*	*Woodsville*
Kilburn, John Cleveland	*A. & S.*	*Concord*
Kimball, Harlan W.	*Engr.*	*Northboro, Mass.*
Kimball, Harold Stanley	*Engr.*	*Farmington*
Kimball, Wilfred Montgomery	*A. & S.*	*New York, N. Y.*
Knapp, Alfred Leroy	*Engr.*	*Haverhill, Mass.*
Kroog, Arthur Benjamin	*A. & S.*	*Needham, Mass.*

Name	Course	P. O. Address
Laaby, Ingeborg	*A. & S.*	*Franklin*
Lawrence, Arthur Noyes	*Agri.*	*North Yarmouth, Me.*
Lawrence, Frederic Stanton	*Engr.*	*Newmarket*
Leath, Cecil Eldon	*Engr.*	*South Milford, Mass.*
Leining, Clara Florence	*A. & S.*	*Manchester*
Levine, David	*A. & S.*	*Portsmouth*
Lewis, Frank Herbert	*Agri.*	*Pelham*
Lewis, Richard James	*A. & S.*	*New Ipswich*
Lintott, Guy Herbert	*Engr.*	*Nashua*
Litchfield, Louis Brooks	*Engr.*	*Brunswick, Me.*
Little, Earl Herbert	*Agri.*	*Colebrook*
Lord, Charles Edward	*Engr.*	*Laconia*
Loughlin, Thomas Daniel	*Engr.*	*Portsmouth*
Lovejoy, Theodore Russell	*Engr.*	*Conway*
Lowell, Wade Harrison	*A. & S.*	*Caldwell, Ida.*
Macfarlane, James, Jr.	*A. & S.*	*Durham*
McGinn, Arthur Paul	*Agri.*	*Rochester*
McGreal, Martin Edward	*Engr.*	*Somersworth*
McKenney, Charles Elmer	*Engr.*	*Brunswick, Me.*
Mann, Janet	*A. & S.*	*Manchester*
Martin, Franklin Goodall	*A. & S.*	*Goffstown*
Martin, William Fawthrop	*Engr.*	*Franklin*
Mathes, Robert Burns	*Engr.*	*Newmarket*
Maxwell, Weyman Everett	*Engr.*	*Agawan, Mass.*
May, William George	*Engr.*	*South Deerfield, Mass.*
Meehan, John Edward	*A. & S.*	*Portland, Me.*
Merrill, Forrest Winn	*Engr.*	*Lowell, Mass.*
Meserve, Abigail	*A. & S.*	*Framingham Center, Mass.*
Meserve, Howard Haley	*Agri.*	*Framingham Center, Mass.*
Middlemas, George Edward	*Agri.*	*Brighton, Mass.*
Montgomery, John Alvaro	*A. & S.*	*Contoocook*
Moody, Hamden Currier	*A. & S.*	*Sunapee*
Moore, Ralph Henry	*A. & S.*	*Laconia*
Morrill, John Edward	*Engr.*	*Nashua*
Morris, Frederic Llewellyn	*Engr.*	*Brunswick, Me.*
Morrison, Raymond Cleveland	*A. & S.*	*Elgin, Ill.*
Moschner, Herman Otto	*Engr.*	*Lisbon Falls, Me.*
Murphy, Helen Elizabeth	*A. & S.*	*Dover*
Nassikas, Achilles John	*Agri.*	*Manchester*

Name	Course	P. O. Address
Neville, Mark Anthony	*A. & S.*	*Portsmouth*
Newcomb, Ernestine Lucinda	*A. & S.*	*Newport*
Newcomb, Paul Standish	*Agri.*	*Swampscott, Mass.*
Newell, Ralph Whipple	*A. & S.*	*Keene*
Nutter, Robert Peary	*Agri.*	*South Portland, Me.*
Oberempst, Dorothy Evelyn	*A. & S.*	*East Hampton, Mass.*
O'Connor, John James	*Engr.*	*Milford*
Odell, Elizabeth Pickering	*A. & S.*	*Greenland*
O'Gara, Francis Joseph	*A. & S.*	*Hanover*
O'Rouke, George Lester	*A. & S.*	*Saco, Me.*
Parker, Kenneth Sanford	*Engr.*	*Derry*
Parkhurst, Ralph Edward	*A. & S.*	*Peterboro*
Patrick, Samuel, Jr.	*Agri.*	*Winthrop, Mass.*
Patridge, Herman Milton	*Engr.*	*Newfields*
Pearson, Oscar Harrison	*Agri.*	*Stratham*
Pease, Frances Katherine	*A. & S.*	*Laconia*
Perkins, Elna Iris	*A. & S.*	*Center Barnstead*
Perkins, Perley Chesman	*A. & S.*	*Wolfeboro*
Pettigrew, Blanche Eleanor	*A. & S.*	*Portsmouth*
Philbrick, Ellsworth Blake	*Engr.*	*Epsom*
Philbrook, Ernest Wilfred	*Engr.*	*Conway Center*
Phillips, Edna Elizabeth	*A. & S.*	*Northfield, Vt.*
Pierce, Ralph Wilson	*Agri.*	*West Somerville, Mass.*
Pike, John Henry	*Engr.*	*Exeter*
Pike, Ray, Jr.	*Engr.*	*Exeter*
Pinkham, Wendell Wadsworth	*A. & S.*	*Portland, Me.*
Piper, Richard Young	*Engr.*	*Portsmouth*
Platt, Charles Grandison	*A. & S.*	*Stratford*
Plouf, Louis Eugene	*Engr.*	*Merrimac, Mass.*
Post, Evan Merritt	*Engr.*	*Durham*
Prescott, Ruth Catherine	*A. & S.*	*Winchester*
Price, Frank Walter	*Engr.*	*South Hampton*
Pulsifer, Roy Scott	*Agri.*	*Plymouth*
Putnam, Charles Norman	*Engr.*	*Amesbury, Mass.*
Quimby, Lawton Buzzell	*Agri.*	*Laconia*
Randall, Russell Edward	*Engr.*	*Swampscott, Mass.*
Randlett, Chester Arthur	*Agri.*	*Laconia*
Reilly, Mary Catherine	*A. & S.*	*Dover*

Name	Course	P. O. Address
*Reynolds, Albert Mills	*Engr.*	*Milton Mills*
Robbins, Alma Pierce	*A. & S.*	*Augusta, Me.*
Roberts, Gertrude Burke	*A. & S.*	*Manchester*
Roberts, James Arnold	*Engr.*	*Dover*
Rodenhiser, Hermon Alonzo	*A. & S.*	*Henniker*
Rogers, Vincent David	*A. & S.*	*Laconia*
Romani, Ida Jeanne	*A. & S.*	*Milford*
Ropes, Charles Augustus	*Engr.*	*Salem, Mass.*
Ross, Augustus Kimball	*Engr.*	*Dover*
Ross, James	*Engr.*	*Kennebunk, Me.*
Rowe, Stacy Buzzell	*A. & S.*	*Newton*
Rowell, Ralph Jewett	*A. & S.*	*Exeter*
Roy, Gedeon Charles	*Engr.*	*Rochester*
Rundlett, Dorothy Frances	*A. & S.*	*Portsmouth*
Russell, George Waldron	*A. & S.*	*Center Strafford*
Sanderson, Mildred Elizabeth	*A. & S.*	*Greenland*
Sargent, Pearle Agnes	*A. & S.*	*Henniker*
Saunders, Paul Charles	*A. & S.*	*New York, N. Y.*
Savage, Gordon James	*Agri.*	*Riverton*
Sawyer, Robert Cushman	*A. & S.*	*Concord*
Saxton, Alice Gertrude	*A. & S.*	*Manchester*
Scott, Evart Fletcher	*Engr.*	*Northwood Narrows*
Scott, Howard Earl	*Engr.*	*Woodfords, Me.*
Seifert, Harold Reed	*A. & S.*	*Brooklyn, N. Y.*
Severance, John Bean	*Engr.*	*East Andover*
Shaddock, Sarah L.	*A. & S.*	*Enfield*
Sheridan, Edward Banks	*Engr.*	*Lowell, Mass.*
Sherry, Helen Catherine	*A. & S.*	*Dover*
Shuttleworth, Clarence George	*Engr.*	*Portsmouth*
Sibley, Cleland Charles	*A. & S.*	*Keene*
Silver, Joseph Clarence	*A. & S.*	*New Ipswich*
Simonds, Erving Robie	*Agri.*	*Hollis*
Small, Murray Gilman	*Engr.*	*Barnstead*
Smith, Gilbert C.	*Engr.*	*Manchester*
Smith, Howard Willis	*Agri.*	*Munroe*
Smith, Roland Alvin	*Agri.*	*Pittsfield*
Spaulding, Russel Smith	*Engr.*	*Walpole*
Speer, Walter Harry	*Engr.*	*Nashua*

* Deceased.

Name	Course	P. O. Address
Spencer, Harry Heath	*Engr.*	*Plymouth*
Stafford, Theodore Whitehouse	*Engr.*	*Berlin*
Stark, Frederick Norman	*Engr.*	*Manchester*
Stevens, Harold Nelson	*Engr.*	*Andover*
Stolovsky, Louis	*Engr.*	*Lebanon*
Sullivan, George Patrick	*A. & S.*	*Manchester*
Tamcales, George Nicholas	*A. & S.*	*Metelene, Greece*
Thomas, Angela Catherine	*A. & S.*	*Durham*
Thompson, Dorothy Lewis	*A. & S.*	*Athol, Mass.*
Tolman, Rodger Milton	*Engr.*	*Chesham*
Towle, Clifton Evans	*Agri.*	*Northwood Narrows*
Towle, Robert Levi	*Engr.*	*Pittsfield*
Tyler, Olive Mary	*A. & S.*	*Worcester, Mass.*
Udall, Marjorie	*A. & S.*	*Farmington*
Volpe, Angelo Vincenzo	*Engr.*	*Plymouth*
Waldo, Donald Warren	*Agri.*	*New Boston*
Walker, Dewey Clifford	*Engr.*	*Littleton*
Walker, Judson Newcombe	*Engr.*	*Marlboro*
Wall, Margaret Hilda	*A. & S.*	*Newburyport, Mass.*
Wallis, Ralph Joseph	*Engr.*	*Laconia*
Watkins, Mabel Jeannette	*A. & S.*	*Portsmouth*
Watson, Fletcher Briggs	*Engr.*	*Derry*
Watts, Carl Wheeler	*A. & S.*	*Berkeley, Cal.*
Wellington, Earle Leonard	*Engr.*	*Keene*
Wetherbee, Charles Addison	*A. & S.*	*Milford*
Whiting, Frederick William	*Agri.*	*Framingham Center, Mass.*
Whitney, Lyman Huntington	*A. & S.*	*Cambridge, Mass.*
Willey, Marion Leonora	*A. & S.*	*Durham*
Williams, Marion Dunlap	*Engr.*	*Portsmouth*
Winkler, Louis Benedict	*A. & S.*	*Exeter*
Woodman, Georgie Ernestine	*A. & S.*	*Newmarket*
Wormwood, Henry Francis	*A. & S.*	*Raymond*
Wooster, Viola Esther	*A. & S.*	*Dover*
Wright, Arthur Lee	*A. & S.*	*Lisbon*
Young, Alvin Eugene	*Agri.*	*Winchester*

TWO-YEAR AGRICULTURAL MEN

Second Year

Name	P. O. Address
Barker, Carl Warren	*Stratham*
Cleveland, Hollis Howe	*Peterboro*
Dailey, James Dewey	*Madbury*
Dexter, Douglas Hibbard	*Lisbon*
Hartwell, Reginald Warner	*Laconia*
Lyford, Sidney John	*Epping*

First Year

Bartlett, Harold Lindon	*Bethel, Me.*
Belanger, Wilfred Clovis	*Waterville, Me.*
Brewster, Nathaniel Blair	*Wolfeboro*
Capron, Charles Wesley	*Marlboro*
Delgado, Pascual	*New York, N. Y.*
Glover, Clifton Harold	*Brookline*
Hasty, Philip Ellis	*Portland, Me.*
Hill, Stanley Forrest	*Laconia*
Holland, (Mrs.) Cora Cleaves	*West Ridge*
Houston, Bayard Gale	*Boscawen*
Jones, Arthur James	*Stoneham, Mass.*
Jones, Richard Lloyd	*Claremont Junction*
Lary, Don Carson	*Shelborne*
Mack, Wallace Preston	*Derry*
Miller, Roswell	*Jamaica Plains, Mass.*
Mills, Walter Prince	*North Conway*
Morgan, George Elliott	*Dover*
Morrow, Robert M.	*Passaic*
Paine, Henry Harrison	*Hyde Park, Mass.*
Parker, Charles	*Hampton Falls*
Parker, Edward Byron	*Franconia*
Rogers, Arthur Artemas	*Laconia*
Ryerson, Robert Wheeler	*Munsonville*
Sarkissian, Kegam	*Smyrna, Greece*
Sheldon, Harley Franklin	*West Moreland*
Shute, Charles Elmer	*West Newbury, Mass.*
Smallwood, Melvin William	*Peabody, Mass.*

Name	Course	P. O. Address
Smith, Earl Edward		*Epping*
Smith, Norman Burton		*Exeter*
Stone, Winthrop Ernest		*Watertown, Mass.*
Story, Frank Clement		*Concord*
Swain, Orin Arthur		*Hampton*
Thayer, Bernard Henry		*Littleton*
Townsend, Charles Maxwell		*Concord*
Wight, Virgil Paine		*Milan*
Wilder, Carl Emery		*Lyndeboro*
Williams, Roger		*Melvin Village*
Woodbury, William Elliott		*Manchester*

SPECIALS

Ajemian, Souren S.	*A. & S.*	*Portsmouth*
Barraclough, Seth Dale	*Engr.*	*Worcester*
Benedict, Elizabeth Harriet	*A. & S.*	*Brookline, Mass.*
Bernasconi, Fidele Pierre	*Engr.*	*Milford*
Churchill, James Bradley	*A. & S.*	*Exeter*
Connor, Stafford Joseph	*Engr.*	*Exeter*
Coyle, John Lawrence	*A. & S.*	*Southington, Conn.*
Cunningham, Leaman Emerson	*Agri.*	*Wolfeboro*
Doyle, Peter James, Jr.	*Agri.*	*Hampton Falls*
Ekdahl, Hulda Elizabeth	*A. & S.*	*Nashua*
Gringel, Carl Herman	*Agri.*	*Norwood, Ohio*
Hamlin, Ray Elbridge	*Agri.*	*Milan*
Hart, Adrian Putnam	*Agri.*	*Cambridge, Mass.*
Hart, Albert Bushnell, Jr.	*Agri.*	*Cambridge, Mass.*
Herrick, Robert Smith	*Agri.*	*Lawrence, Mass.*
Langley, Mary Clark	*A. & S.*	*Durham*
Loveren, Harold William	*Engr.*	*Manchester*
Lund, James, Jr.	*Agri.*	*Malden, Mass.*
Phelps, George Osborn	*Engr.*	*Nashua*
Snyder, James Henry	*A. & S.*	*Berlin*
White, Chester Lee	*Agri.*	*Wichita Falls, Tex.*

SUMMARY OF REGISTRATION, 1919–1920

	Agriculture						Arts and Science						Engineering									
								H. E.							E. E.		M. E.					
	Gen.	*T. T.	A.H. &D.	For.	Hort.	Total	Gen.	*T. T.	Reg.	Arts Chem.	M.A.T.	Total	Ch.	Arch.	Reg.	*Cnst	Reg.	*Cnst	Total	Men	Women	Total
Seniors	.....	2	15	2	3	22	39	3	11	.....	1	54	10	.....	12	.....	5	.....	27	67	36	103
Juniors	.....	3	9	7	9	28	56	1	13	1	3	74	9	1	16	1	2	4	33	95	40	135
Sophomores	15	1	10	1	.....	27	80	....	10	9	.....	99	17	1	13	11	6	6	54	145	35	180
Freshmen	33	....	11	4	1	49	120	2	20	11	.....	153	22	8	43	5	37	13	128	259	71	330
Total, 4-yr. students.	48	6	45	14	13	126	295	6	54	21	4	380	58	10	84	17	50	23	242	566	182	748
2d-yr. two year	6	....	.....	....	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	....	6
1st-yr. two year	38	....	.....	....	.....	38	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37	1	38
Graduates	.....	.....	.....	.....	1	1	2	.....	.....	.....	.....	2	2	.....	.....	.....	.....	.....	2	3	2	5
Specials	4	....	4	1	1	10	5	....	1	.....	.....	6	1	.....	1	.....	2	1	5	19	2	21
Total, Others	48	....	4	1	2	55	7	....	1	.....	.....	8	3	.....	1	.....	2	1	7	65	5	70
Total, all students	96	6	49	15	15	181	302	6	55	21	4	388	61	10	85	17	52	24	249	631	187	818

*T.T.=Teacher Training Course. *Cnst.=Construction Course.

COMPARATIVE REGISTRATION—10 YEAR PERIOD

	Four-Year Courses	Other Courses	Men	Women	Total
1910–11	203	63	249	17	266
1911–12	226	81	285	22	307
1912–13	250	86	306	30	336
1913–14	288	97	322	63	385
1914–15	365	127	405	87	492
1915–16	442	176	505	113	618
1916–17	561	99	515	145	660
1917–18	520	42	399	163	562
*1918–19	589	18	439	168	607
1919–20	748	170	631	187	818

*During 1918–19 there were 1,467 additional men registered for special military work under the S.A.T.C. organization.